[illegible]

February 2005

105-05062/

SURVEY OF RARE VASCULAR PLANTS IN FIDLER-GREYWILLOW WILDLAND PROVINCIAL PARK

Ksenija Vujnovic,
Lorna Allen,
Derek Johnson
and
Dragomir Vujnovic

February 2005

A report prepared for Parks and Protected Areas, Alberta Community Development, Edmonton, Alberta.

Front page: Fidler-Greywillow Wildland Provincial Park (© K. Vujnovic)

For copies of this report, contact:
Alberta Natural Heritage Information Centre
Alberta Community Development
2nd Floor, 9820 – 106 Street
Edmonton, AB T5K 2J6
780-427-6621

ISBN: 0-7785-3704-8 (Printed Edition)
ISBN: 0-7785-3705-6 (On-line Edition)

On-line Edition:
Website: http://www.cd.gov.ab.ca/preserving/parks/anhic/reports.asp

This publication may be cited as:

Vujnovic, K., L. Allen, J. D. Johnson, and D. Vujnovic. 2005. Survey of Rare Vascular Plants in Fidler-Greywillow Wildland Provincial Park. A report prepared for Parks and Protected Areas, Alberta Community Development, Edmonton, Alberta. 101 pp.

TABLE OF CONTENTS

TABLE OF CONTENTS ii

LIST OF APPENDICES iii

LIST OF FIGURES iii

LIST OF TABLES vi

INTRODUCTION 1

METHODS 3

Pre-fieldwork 3
Field Data Collection 3
Post-fieldwork 4

RESULTS 7

SPECIES ON TRACKING LIST 9

Barbarea orthoceras Ledeb. (American winter cress) 9
Botrychium simplex E. Hitchc. (dwarf grape fern) 12
Carex capitata L. (capitate sedge) 14
Carex echinata Murr. ssp. *echinata* (little prickly sedge) 16
Carex lenticularis var. *dolia* (M.E. Jones) L.A. Standley (lens-fruited sedge) 18
Carex lenticularis var. *lenticularis* 20
Carex oligosperma Michx. (few-fruited sedge) 22
Carex rostrata Stokes (beaked sedge) 24
Carex supina Willd. ex Wahlenb. (weak sedge) 27
Carex umbellata Schkuhr ex Willd. (umbellate sedge) 29
Danthonia spicata (L.) Beauv. ex Roemer & J.A. Schultes (poverty oat grass) 31
Gymnocarpium jessoense (Koidzumi) Koidzumi (northern oak fern) 33
Huperzia (Lycopodium) selago (L.) Bernh. ex Mart. & Schrank (mountain club-moss) 35
Hypericum majus (Gray) Britt. (large Canadian St. John's-wort) 37
Isoetes echinospora Durieu (northern quillwort) 39
Juncus brevicaudatus (Engelm.) Fern. (short-tail rush) 41
Juncus filiformis L. (thread rush) 43
Juncus stygius L. ssp. *americanus* (Buch.) Hult. (marsh rush) 45
Leymus (Elymus) mollis (Trin.) Hara (American dune grass) 47
Luzula groenlandica Bocher (wood-rush) 49
Lycopodiella inundata (L.) Holub (bog club-moss) 51
Polypodium sibiricum Sipl. (Siberian polypody) 53
Potentilla multifida L. (branched cinquefoil) 56
Puccinellia distans ssp. *hauptiana* (Trin. ex Krecz.) W.E. Hughes 58
Rhynchospora capillacea Torr. (slender beak-rush) 60

Sagina nodosa (L.) Fenzl (pearlwort) 62
Tanacetum bipinnatum spp. *huronense* (Nutt.) Breitung (Indian tansy) 64
Vaccinium uliginosum L. (bog bilberry) 66

SPECIES WITH QUESTIONABLE IDENTIFICATION AND THOSE ON THE WATCH LIST 68

Viola cf. *pallens* (Banks ex DC.) M.S. Baker (Macloskey's violet) 68
Cypripedium acaule Ait. (stemless lady's-slipper) 71
Dryopteris fragrans (L.) Schott (fragrant shield fern) 73
Woodsia ilvensis (L.) R. Br. (rusty woodsia) 75

DISCUSSION 76

Site significance 76
Conservation concerns 76
Recommendations for future studies 77
Study limitations 77

CONCLUSION 78

ACKNOWLEDGEMENTS 78

REFERENCES CITED 79

LIST OF APPENDICES

APPENDIX 1 Map of Natural Regions and Subregions of Alberta. 82

APPENDIX 2 Vascular Plants of Fidler-Greywillow Wildland Provincial Park. 83

APPENDIX 3 List of tracked vascular plants with one or more occurrences mapped within 2.5 km of the Kazan Uplands and Athabasca Plain Natural Subregions (ANHIC 2001). 94

APPENDIX 4 An explanation of sub-national/provincial (S) and global (G) ranks. 99

APPENDIX 5 Rare Native Plant Report Form. 100

LIST OF FIGURES

FIGURE 1 Fidler-Greywillow Wildland Provincial Park: Location. 6

FIGURE 2 *Barbarea orthoceras* Ledeb. (American winter cress). A – image of the plant: B – known locations of *Barbarea orthoceras* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 11

FIGURE 3 *Botrychium simplex* E. Hitchc. (dwarf grape fern). A – image of the plant: B – known locations of *Botrychium simplex* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 13

FIGURE 4 *Carex capitata* L. (capitate sedge). A – image of the plant: B – known locations of *Carex capitata* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 15

FIGURE 5 *Carex echinata* Murr. ssp. *echinata* (little prickly sedge). A – image of the plant: B – known locations of *Carex echinata* spp. *echinata* within Alberta; C – known locations of the subspecies in Fidler-Greywillow Wildland Provincial Park. 17

FIGURE 6 *Carex lenticularis* var. *dolia* (M.E. Jones) L.A. Standley (lens-fruited sedge). A – image of the plant: B – known locations of *Carex lenticularis* var. *dolia* within Alberta; C – known locations of the variety in Fidler-Greywillow Wildland Provincial Park. 19

FIGURE 7 *Carex lenticularis* var. *lenticularis* . A – image of the plant: B – known locations of *Carex lenticularis* var. *lenticularis* within Alberta; C – known locations of the variety in Fidler-Greywillow Wildland Provincial Park. 21

FIGURE 8 *Carex oligosperma* Michx. (few-fruited sedge). A – image of the plant: B – known locations of *Carex oligosperma* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 23

FIGURE 9 *Carex rostrata* Stokes (baked sedge). A – image of the plant: B – known locations of *Carex rostrata* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 26

FIGURE 10 *Carex supina* Willd. ex Wahlenb. (weak sedge). A – image of the plant: B – known locations of *Carex supina* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 28

FIGURE 11 *Carex umbellata* Schkuhr ex Willd. (umbellate sedge). A – image of the plant: B – known locations of *Carex umbellata* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 30

FIGURE 12 *Danthonia spicata* (L.) Beauv. ex Roemer & J.A. Schultes (poverty oat grass). A – image of the plant: B – known locations of *Danthonia spicata* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 32

FIGURE 13 *Gymnocarpium jessoense* (Koidzumi) Koidzumi (northern oak fern). A – image of the plant: B – known locations of *Gymnocarpium jessoense* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 34

FIGURE 14 *Huperzia (Lycopodium) selago* (L.) Bernh. ex Mart. & Schrank (mountain club-moss). A – image of the plant: B – known locations of *Huperzia (Lycopodium) selago* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 36

FIGURE 15 *Hypericum majus* (Gray) Britt. (large Canadian St. John's-wort). A – image of the plant: B – known locations of *Hypericum majus* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 38

FIGURE 16 *Isoetes echinospora* Durieu (northern quillwort). A – image of the plant: B – known locations of *Isoetes echinospora* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 40

FIGURE 17 *Juncus brevicaudatus* (Engelm.) Fern. (short-tail rush). A – image of the plant: B – known locations of *Juncus brevicaudatus* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 42

FIGURE 18 *Juncus filiformis* L. (thread rush). A – image of the plant: B – known locations of *Juncus filiformis* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 44

FIGURE 19 *Juncus stygius* L. ssp. *americanus* (Buch.) Hult. (marsh rush). A – image of the plant: B – known locations of *Juncus stygius* ssp. *americanus* within Alberta; C – known locations of the subspecies in Fidler-Greywillow Wildland Provincial Park. 46

FIGURE 20 *Leymus (Elymus) mollis* (Trin.) Hara (American dune grass). A – image of the plant: B – known locations of *Leymus (Elymus) mollis* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 48

FIGURE 21 *Luzula groenlandica* Bocher (wood-rush). A – image of the plant: B – known locations of *Luzula groenlandica* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 50

FIGURE 22 *Lycopodiella inundata* (L.) Holub (bog club-moss). A – image of the plant: B – known locations of *Lycopodiella inundata* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 52

FIGURE 23 *Polypodium sibiricum* Sipl. (Siberian polypody). A – image of the plant: B – known locations of *Polypodium sibiricum* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 55

FIGURE 24 *Potentilla multifida* L. (branched cinquefoil). A – image of the plant: B – known locations of *Potentilla multifida* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 57

FIGURE 25 *Puccinellia distans* ssp. *hauptiana* (Trin. ex Krecz.) W.E. Hughes. A – image of the plant: B – known locations of *Puccinellia distans* ssp. *hauptiana* within Alberta; C – known locations of the subspecies in Fidler-Greywillow Wildland Provincial Park. 59

FIGURE 26 *Rhynchospora capillacea* Torr. (slender beak-rush). A – image of the plant: B – known locations of *Rhynchospora capillacea* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 61

FIGURE 27 *Sagina nodosa* (L.) Fenzl (pearlwort). A – image of the plant: B – known locations of *Sagina nodosa* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 63

FIGURE 28 *Tanacetum bipinnatum* ssp. *huronense* (Nutt.) Breitung (Indian tansy). A – image of the plant: B – known locations of *Tanacetum bipinnatum* ssp. *huronense* within Alberta; C – known locations of the subspecies in Fidler-Greywillow Wildland Provincial Park. 65

FIGURE 29 *Vaccinium uliginosum* L. (bog bilberry). A – image of the plant: B – known locations of *Vaccinium uliginosum* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 67

FIGURE 30 *Viola* cf. *pallens* (Banks ex DC.) M.S. Baker (Macloskey's violet). A – image of the plant: B – known locations of *Viola* cf. *pallens* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 70

FIGURE 31 *Cypripedium acaule* Ait. (stemless lady's-slipper). A – image of the plant: B – known locations of *Cypripedium acaule* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 72

FIGURE 32 *Dryopteris fragrans* (L.) Schott (fragrant shield fren). A – image of the plant: B – known locations of *Dryopteris fragrans* within Alberta; C – known locations of the species in Fidler-Greywillow Wildland Provincial Park. 74

LIST OF TABLES

TABLE 1 List of all vascular plant taxa from the Tracking and Watch Lists that were found in FGWPP in 2001; * indicates those taxa not reported for FGWPP prior to 2001; "X" symbol indicates whether taxon was encountered on mainland, on Burntwood Island and/or on Bustard Island. 7

INTRODUCTION

Fidler-Greywillow Wildland Provincial Park (FGWPP) is one of 81 recently designated protected areas, established in March 1998. It is a remote site located in the northeast corner of Alberta, north of Lake Athabasca, about 315 km north of Ft. McMurray. This park includes portions of the north shore of Lake Athabasca (from Fidler Point in the west to about 3.5 km northeast of Cypress Point in the east) and a series of islands, two of which are amongst the largest islands in the lake (Bustard and Burntwood Islands) (Figure 1). FGWPP falls within the Kazan Upland and Athabasca Plain subregions of the Canadian Shield Natural Region of Alberta (Appendix 1; see also Achuff 1994)

Most background information relevant to the flora and vegetation of this site came from one limited biophysical inventory that was focused on Fidler Point and surrounding area (Fairbarns et al. 1984), and from historical reports on a similar area at Shelter Point and Sand Point (situated about 40 km and 25 km southwest of Fidler Point, respectively) (Raup 1928, 1936, 1946).

Two main landscape units characterize FGWPP:

- extensive outcrops of Precambrian granite and gneiss typical of the Kazan Upland Subregion (Green et al. 1970), found behind the sandy shoreline, but sometimes extending as rocky points right to the water's edge, and
- a series of islands (part of the Athabasca Plain Subregion) and sandy and rocky beaches along the northern shoreline of Lake Athabasca, largely shaped by wave, wind and ice action (transition area between the Athabasca Plain and Kazan Upland natural subregions).

The north shore of Lake Athabasca also includes smaller landscape features, such as eroded dune ridges behind sandy flats, areas where small creeks intercept dune ridges and drain into the lake, and a small area of late Precambrian sandstone that outcrops at Fidler Point (Green et al. 1970).

The forests of the region are generally described as predominantly coniferous, with jack pine (*Pinus banksiana*) and white spruce (*Picea glauca*) dominating in mesophytic areas, and black spruce (*Picea mariana*) with occasional larch (*Larix laricina*) growing in various wetland sites. Alaska birch (*Betula neoalaskana*) is noted as one of the typical associated species. Open forests of jack pine predominate over large areas north of Lake Athabasca, occupying both sandy ridges and rocky hills of granite and hard metamorphic rock. Alaska birch accompanies pine in some places. White spruce may be abundant in some stands on rocky ground, but it is being replaced by a black spruce in stands on sandy soils. Open mixed stands of white spruce and Alaska birch occur on stony shore ridges and " ancient" beaches. Sedge marshes, swamps and black spruce forests occupy poorly drained depressions. Lichen-heath characterizes vast areas of bedrock outcrops, with extensive lichen cover over much of the rock, and vascular plant growth found only in spots where thin soils have developed in crevices and depressions in the rock. Dune scrub is found on larger sandy beaches along the Lake Athabasca. Shore vegetation consists of communities on the shore of Lake Athabasca and those around ponds and small lakes. Raup (1928, 1946) and Wallis and Wershler (1984) provide more detailed descriptions of the above-listed habitats and the associated flora.

Wallis and Wershler (1984) compiled a list of over 315 vascular plant taxa for the Canadian Shield north of Lake Athabasca, of which 239 were found in the Kazan Upland portion of the area. It was partially based on the list reported in Raup's "Catalogue of the Vascular Plants" (Raup 1936) and supplemented by the information from 1983 studies conducted by the authors in the Wylie Lake and Colin-Woodman lakes areas.

The first account of vascular plants specific to FGWPP came from a survey conducted in 1984 at Fidler Point and Bustard and Burntwood Islands (Fairbarns et al. 1984). This survey resulted in the list of 227 vascular plant taxa provided in Appendix 2. The 1984 survey was limited in scope, but still resulted in finding 15 rare vascular plant taxa that are presently tracked by the Alberta Natural Heritage Information Center (ANHIC) (Vujnovic and Gould 2002), as follows: winter cress (*Barbarea orthoceras*), capitate sedge (*Carex capitata*), few-fruited sedge (*Carex oligosperma*), beaked sedge (*Carex rostrata*), mountain club-moss (*Huperzia* (*Lycopodium*) *selago*), St John's-wort (*Hypericum majus*), short-tail rush (*Juncus brevicaudatus*), thread rush (*Juncus filiformis*), American dune grass (*Leymus* (*Elymus*) *mollis*), wood-rush (*Luzula groenlandica*), branched cinquefoil (*Potentilla multifida*), pearlwort (*Sagina nodosa*), rock polypody (*Polypodium sibiricum*), Indian tansy (*Tanacetum bipinnatum* ssp. *huronense*) and bog

bilberry (*Vaccinium uliginosum*). These and other potentially rare vascular plant taxa were expected to be found in other places within the park's boundary, as much of the site had not yet been inventoried. During the summer of 2001, a multi-disciplinary biophysical inventory of FGWPP was organized to collect information on numerous aspects of the biological diversity of the site, including provincially rare vascular plants.

The two main objectives of this reconnaissance survey were: a) to document location, habitat and population size information for tracked vascular plant taxa occurring within the study site; b) to update the list of vascular plant species for FGWPP.

METHODS

The logistics of this project can be divided into three separate components: pre-fieldwork, field data collection, and post-fieldwork data processing and analyses.

Pre-fieldwork

To develop a list of rare vascular plant species potentially occurring within the study area, a list of tracked vascular plants with one or more occurrences mapped within 2.5 km of the Kazan Uplands and Athabasca Plain natural subregions was developed by querying the ANHIC database (ANHIC 2001). General habitat descriptions for each species on the list were then extracted from Moss (1983) and supplemented by more detailed habitat descriptions stored in ANHIC element occurrence files (ANHIC 2001). The list of potentially occurring rare vascular plants and the habitats they have been found in (including known habitats from outside the Canadian Shield Natural Region) is presented in Appendix 3.

Aerial photographs for FGWPP were then reviewed to identify the locations of habitats with high potential for finding rare vascular plants. Identified locations were then considered target areas for the field survey. Locations of some of the habitats listed in Appendix 3 as supporting rare plants species (i.e. wet edges of lakes, creeks, streams and beaver ponds; marshes with open water; sandy and rocky lake beaches; rock outcrops; sand dunes; cliff faces) were fairly easy to identify from 1:15,000 aerial photographs. Some of the rare species however are associated with microhabitats not easily identified on aerial photographs. These included various forest types. To increase the chances of incidental accounts of rare plants, various deciduous (*Betula neoalaskana, Populus tremuloides* dominated), coniferous (*Picea mariana, Picea glauca* or *Pinus banksiana* dominated) and mixed stands were identified as additional target areas. Inclusion of these additional target sites also aimed toward ensuring better coverage of the overall site diversity (rare plus more common vascular plant taxa).

A list of all vascular plant species previously found at Fidler Point (FGWPP) was compiled from Fairbarns et al. (1984). It included 227 vascular plant taxa (including those at the subspecies level), as shown in Appendix 2.

Keys to more difficult vascular plant taxa were compiled and voucher specimens deposited at the University of Alberta herbarium were consulted to improve the surveyor's ability to recognize these taxa in the field.

Field Data Collection

The survey was conducted between July 17 and 26, 2001, during which time as many target areas as possible were visited (given the size of the park, the limited accessibility of many areas, and limited time allocated for this inventory, it was not possible to visit all of them). Sites were accessed on foot or by boat. At least one location of each of the habitats expected to support rare plant taxa and each of the additional target areas (various forest types) were surveyed for rare vascular plants. The sites were searched in a meandering manner to increase the chance of finding rare taxa. When a rare taxon was encountered, the occurrence was marked with a Garmen 76 GPS unit. When time permitted, the extent of the area occupied by a particular rare taxon was captured by a number of points marked with the Garmen unit. The identified area was then considered a sub-population of this taxon and described in field books for later entry into the ANHIC element occurrence files (a complete list of relevant information is shown on the Rare Native Plant Report Form, Appendix 5). Photographs depicting rare taxa and their locations were taken whenever possible.

Because of the reconnaissance nature of this survey, little emphasis was put on defining "an individual" for each rare taxon for the purpose of estimating its population size. Instead, different counting units were applied to simplify counting and make the best use of available time. For example, **individual plants** were counted/estimated for those taxa that do not grow from rhizomes and that have individual plants separated enough to allow for counting/estimating (e.g., *Barbarea orthoceras*, *Botrychium simplex*, *Danthonia spicata*, *Sagina nodosa*). The number of **"plants"** was counted/estimated for those taxa that do spread by rhizome, but aboveground appear like they grow as individual plants (e.g., *Carex supina*, *Hypericum majus*, *Tanacetum bipinnatum*, *Viola* cf. *pallens*). **Patches** were counted (and their size often provided) for low, densely growing taxa, such as *Huperzia selago* and *Polypodium sibiricum*. Although *Carex capitata* does not generally fall in this general category of "low, densely growing taxa", its population was also estimated through a count of "patches" because of its restriction to moist mossy patches in cracks of rock outcrops. **Stems** were estimated for densely growing *Juncus filiformis* because of its morphological characteristics (thread-like appearance of stems with reduced leaves). The counting unit for each of the species is provided in the description section within each of the species write-ups. Population sizes reported by other surveyors in the past have been presented in their original form. This resulted in inconsistency in terminology within the population size description for a single taxon.

While attempts were made to document the actual size of a sub-population and the area of occupancy for each rare taxa encountered, available time was often insufficient to ensure the completeness of this information. The extensive sandy shoreline of Lake Athabasca proved to be a particularly challenging area in that it harboured numerous rare taxa that occurred in mosaic patterns that required great amounts of time to investigate. Because of time and logistical constraints, vast areas of the park remain unsurveyed that potentially harbour rare vascular plant taxa, and many of the surveyed areas have not been investigated in enough detail to ensure that no rare taxa have been missed. Also, some vascular plants do not grow every year, so somewhat different results could be obtained if a similar study was conducted in another year. Finally, there may be some spring flowering taxa that were missed during the survey in July.

A list of all noted vascular plant taxa found (as shown in Appendix 2) was updated daily by checking off previously noted taxa and adding new taxa to the list whenever encountered in the field. Space limitations did not allow for a complete collection of voucher specimens. Voucher specimens were collected for those rare taxa where it was estimated that the removal of an individual would not harm the long-term persistence of a sub-population. Collections were made for a number of non-rare vascular plant taxa (mainly specimens of difficult taxonomic groups, of unknown species, or of those species newly reported for the park). Specimens were then identified in the camp. Those of non-rare or previously reported species for the park were disposed of. Others were pressed for later identification and documentation.

The lead author of this report spent ten working days on the focused rare plant survey in the study area. Working hours ranged from 10 to 11, including about an hour every day for in-camp plant identification and preparation of voucher specimens. The co-authors Lorna Allen and Derek Johnson focused their work on the significant small patch communities and on rare non-vascular plants and lichens, respectively. Their encounters with rare vascular plant taxa were of somewhat incidental nature so their time-share for finding rare vascular plant taxa would be hard to estimate. A few additional locations of rare vascular plants were reported by other crewmembers of the biophysical inventory team.

Post-fieldwork

All notes from field books have been typed and a digital file resides with ANHIC for future reference. Voucher specimens were annotated by Patsy Cotterill (ANHIC research assistant) and those of known taxa were mounted on herbarium sheets and labelled. Specimens of difficult taxonomic groups were sent to appropriate authorities for annotations. Once returned, annotated specimens were also mounted and labelled. Prior to depositing voucher specimens in various herbaria, label information for tracked species was entered into the ANHIC database for further element occurrence processing. All vouchers were finally deposited at the University of Alberta, Canadian Forest Service or ANHIC herbaria.

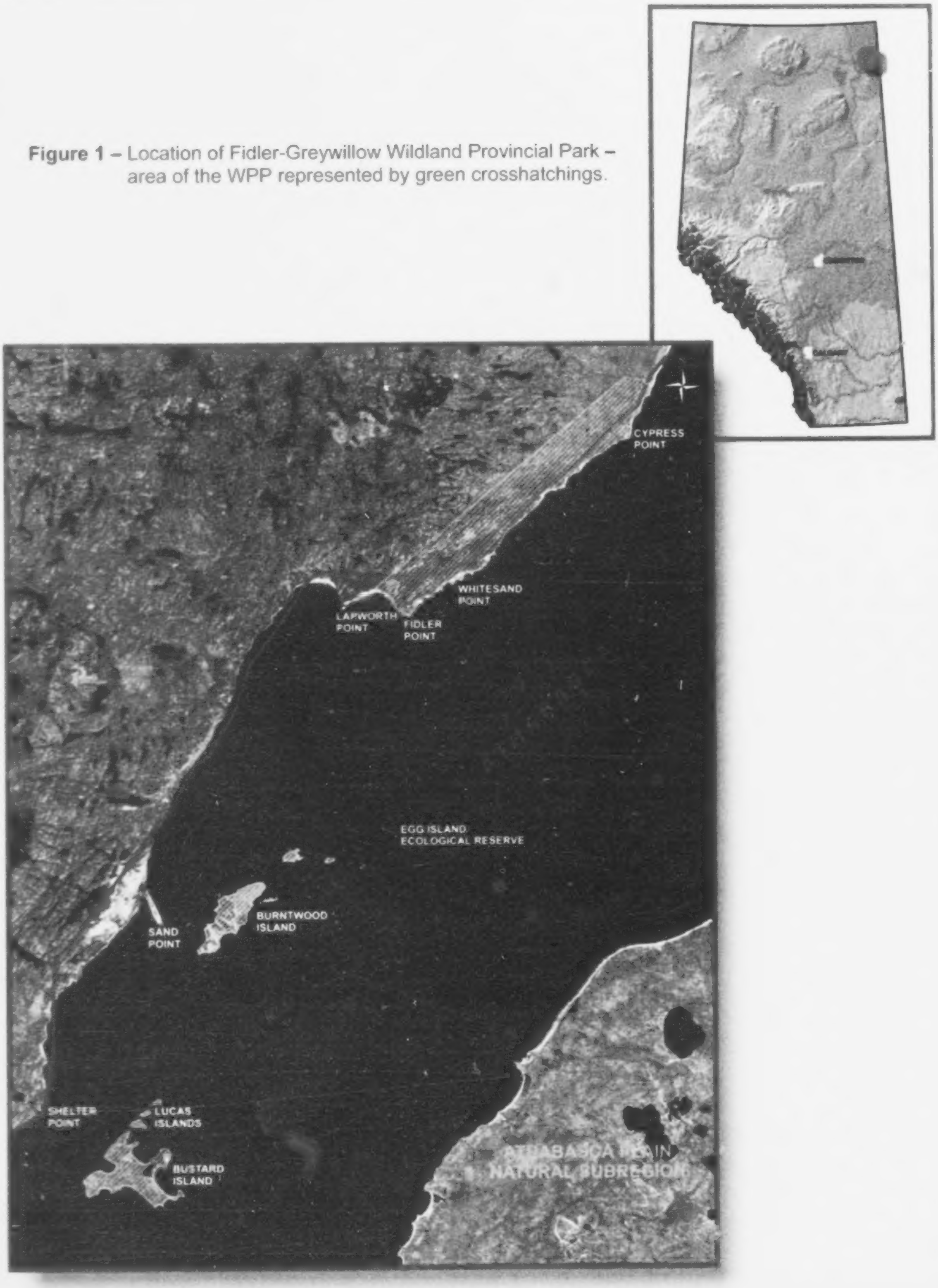
All locations where tracked vascular plant taxa were found, based on collected specimens and field notes, were mapped as either a point location or a polygon on 1:50,000 NTS NTS maps. To assist with the mapping process and for future reference, all point data from the GPS unit were downloaded into GIS software and overlaid onto a digital orthophoto mosaic of the park. This facilitated decision-making on whether locations should be mapped as points or combined into a polygon, and assisted in creation of the site distribution maps for this report.

Once all locations for a taxon were mapped, those sites separated by 1 km or less were assumed to belong to the same population; those separated by greater than a kilometre were considered separate populations. This is the separation distance recommended in NatureServe methodology to differentiate populations (NatureServe, 2004b), however, additional surveys are needed to be sure that these are in fact different populations. The term "population" will be used in this report in its more general sense indicating all individuals of a particular taxon within a particular area (specific location, study site or at the provincial scale).

Scientific names in this report follow Moss (1983) for the most part, but have been updated to be consistent with the taxonomy used in ANHIC. When taxonomy other than Moss (1983) is used, the name found in Moss is enclosed in parentheses. Common names follow Ealey (1993), but also have been updated to be consistent with the ANHIC database.

Slides taken during this survey by K. Vujnovic have been digitised and both digital files and original slides reside with ANHIC. Original slides taken by L. Allen and D. Johnson reside with the photographers, but selected slides have been digitised and digital copies are available through ANHIC.

Figure 1 – Location of Fidler-Greywillow Wildland Provincial Park – area of the WPP represented by green crosshatchings.


CYPRESS POINT
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
EGG ISLAND ECOLOGICAL RESERVE
BURNTWOOD ISLAND
SAND POINT
SHELTER POINT
LUCAS ISLANDS
BUSTARD ISLAND
ATHABASCA PLAIN NATURAL SUBREGION

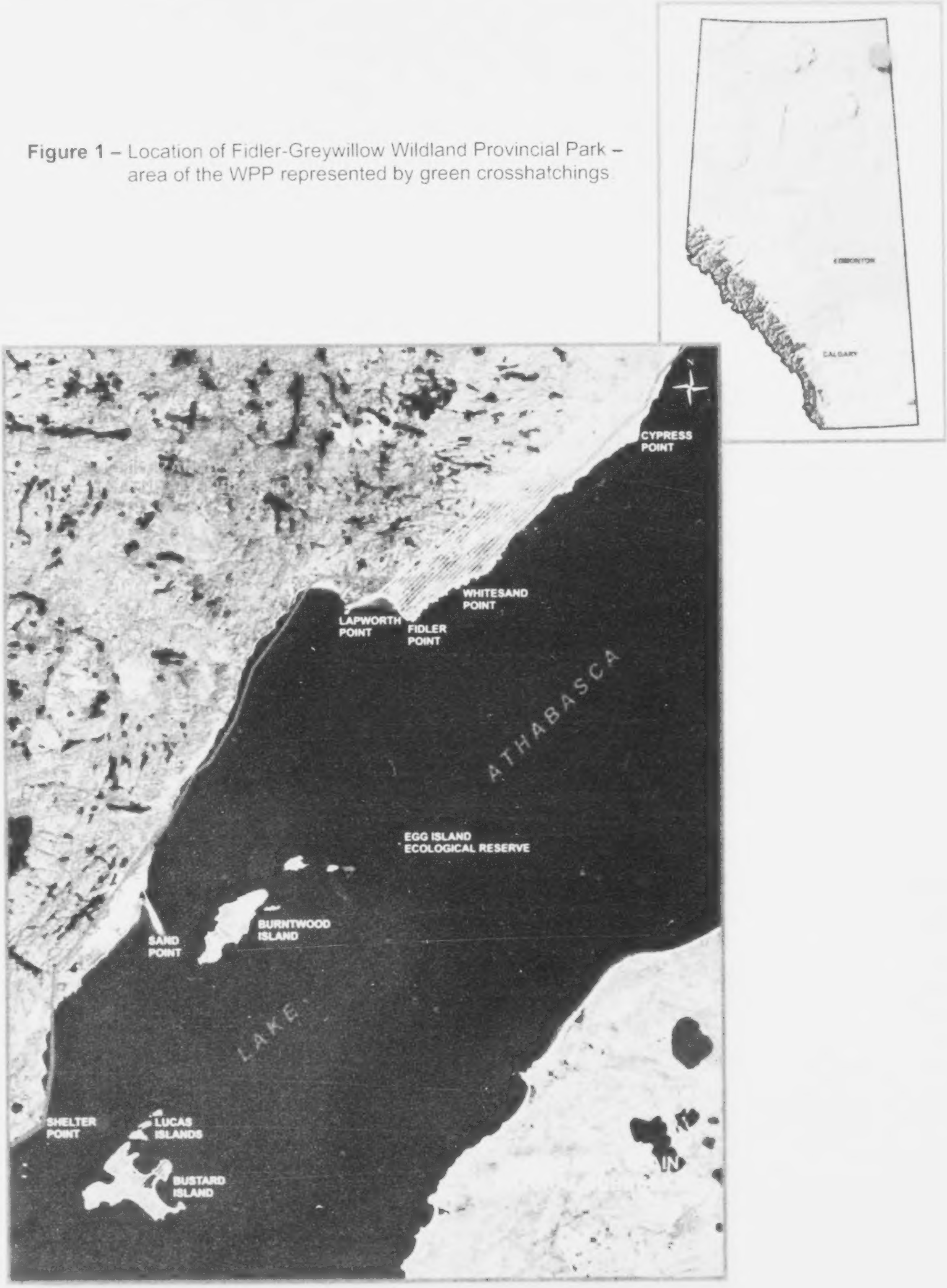

EDMONTON
CALGARY
N
CYPRESS POINT
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
ATHABASCA
EGG ISLAND ECOLOGICAL RESERVE
BURNTWOOD ISLAND
SAND POINT
LAKE
SHELTER POINT
LUCAS ISLANDS
BUSTARD ISLAND

Figure 1 – Location of Fidler-Greywillow Wildland Provincial Park – area of the WPP represented by green crosshatchings

RESULTS

This inventory resulted in the addition of 120 vascular plant taxa to the original list of 227 taxa for FGWPP as reported in Fairbarns et al. (1984) (see Appendix 2 for a list of vascular plant taxa reported up to date).

Although one of the objectives of this inventory was to update the list of vascular plant species for FGWPP, this study focused primarily on documenting provincially rare species, therefore little attention will be given to the general floristic characteristics of the area in this report. However, it is worth noting that Bustard Island appeared floristically different from the rest of the park in that it was far more temperate, without the prominent rock outcrops, and the vegetation was more "southern" than the exposed north shore of Lake Athabasca in the main portion of the park. The island was more like mixedwood boreal than boreal shield (vis a vie the presence of *Anemone canadensis, Carex aurea, C. concinna, Cornus stolonifera, Salix pseudomonticola,* and *Symphoricarpos albus*).

Twenty-eight (28) (possibly 29) vascular plant taxa that are on the 2002 vascular plant Tracking List and three from the 2002 Watch List were recorded during this survey (Table 1). Thirteen of these species are presently ranked S1 in Alberta, three are ranked S1S2, nine are ranked S2, two are ranked S2S3, and three are ranked S3. Global ranks for Tracked and Watched taxa noted range from G5T3Q to G5 (for details on provincial and global ranking please see Appendix 4). Fourteen (14) taxa have not been reported previously for this park (marked with an asterisk) and one of them, *Carex echinata* ssp. *echinata*, is a new addition to the flora of Alberta. *Hypericum majus* was the only rare vascular species previously reported for Bustard Island and none were previously known from Burntwood Island. This survey reported an additional 16 taxa from these two islands (see Table 1 below). Although the *Viola* species could be *V. pallens* as the habit and habitat were appropriate, the identification of this species remains tentative because a flower is needed to confirm the identification (Joyce Gould - personal comm.) and all reproductive individuals were past fruit dispersal.

Table 1 – List of all vascular plant taxa from the Tracking and Watch Lists that were found in FGWPP in 2001; * – indicates those taxa not reported for FGWPP prior to 2001; "**X**" – symbol indicates whether taxon was encountered on mainland, on Burntwood Island and/or on Bustard Island.

Scientific Name	Main land	Burntwood Island	Bustard Island	Provincial (S) and Global (G) ranks	
Tracking List					
Barbarea orthoceras	X	X		S2	G5
*Botrychium simplex**	X			S2	G5
Carex capitata	X			S2	G5
Carex echinata ssp. *echinata**	X	X		S1	G5T5
Carex lenticularis var. *dolia* *	X			S1	G5T3Q
Carex lenticularis var. *lenticularis* *		X		S1	G5T5
Carex oligosperma	X			S1S2	G4
Carex rostrata	X	X		S2	G5
Carex supina *	X			S1	G5
Carex umbellata *	X	X		S1	G5
Danthonia spicata *	X			S1S2	G5
Gymnocarpium jessoense *	X			S1	G5
Huperzia (Lycopodium) selago	X			S1	G5
Hypericum majus	X	X	X	S2	G5
Isoetes echinospora *			X	S1	G5?
Juncus brevicaudatus	X	X		S2	G5
Juncus filiformis	X	X	X	S2S3	G5
Juncus stygius *	X	X		S2	G5
Leymus mollis	X		X	S1	G5
Luzula groenlandica	X			S1	G4
Lycopodiella inundata (Lycopodium inundatum)	X			S1	G5
Polypodium sibiricum	X			S2S3	G5?
Potentilla multifida *	X			S1	G5
Puccinellia distans ssp. *hauptiana* *		X		S1	G5T3T4
Rhynchospora capillacea *		X		S1	G5

Scientific Name	Main land	Burntwood Island	Bustard Island	Provincial (S) and Global (G) ranks	
Sagina nodosa	X	X		S1	G5
Tanacetum bipinnatum ssp. *huronense*	X	X		S2	G5T4T5
Vaccinium uliginosum	X			S2	G5
Viola cf. *pallens* *	X	X		S1S2	G5T5
Watch List					
Cypripedium acaule		X		S3	G5
Dryopteris fragrans	X			S3	G5
Woodsia ilvensis	X			S3	G5

Six of the rare/watched taxa were found growing only on rock outcrops typical of the Kazan Upland Natural Subregion. These include *Carex capitata, Carex umbellata, Huperzia selago, Polypodium sibiricum, Potentilla multifida* and *Woodsia ilvensis;* two of these (*Carex capitata, Potentilla multifida*) were found only on rocks extending as rocky points right to the water's edge, but not further inland.

Three of the rare species were found only on the islands in Lake Athabasca: *Isoetes echinospora* on Bustard Island and *Puccinellia distans* ssp. *hauptiana* and *Rhynchospora capillacea* on Burntwood island.

The biggest number of rare plant taxa (15) was found on sandy beaches along the north shore of Lake Athabasca, and some locations on the shores of the islands. *Barbarea orthoceras, Botrychium simplex, Carex echinata* ssp. *echinata, Carex lenticularis* var. *lenticularis, Hypericum majus, Juncus brevicaudatus, Juncus filiformis, Luzula groenlandica, Puccinellia distans* ssp. *hauptiana, Rhynchospora capillacea, Sagina nodosa* and *Viola* cf. *pallens* were all found growing in somewhat protected sandy bays on moist sands, often between cobbles, or on moist sands near creek outlets. *Lycopodiella inundata* was also found in somewhat protected sandy bays, but back from the shoreline and near the forest edge. *Leymus mollis* and *Tanacetum bipinnatum* ssp. *huronense* were found on slightly exposed lake beaches, on low, stabilizing, discontinuous dunes, situated above the active wave zone and behind an area of unvegetated, dry blowing sand.

The next section provides a summary for each of the Tracking List species discussed above (less details are provided for Watch List species). Each summary includes: scientific and common names; family name; brief description including photograph of the species; provincial (sub-national) and global ranks; distribution in Fidler-Greywillow WPP, Alberta and globally; description of the habitat of the species in Fidler-Greywillow WPP, Alberta and elsewhere; population size information; list of protected areas that include known locations; and notes (optional). The taxa are ordered alphabetically by scientific name. [It is important to note here that habitat descriptions from areas outside the study site that have been extracted from the ANHIC database and other sources of information (published literature) are presented in this section in more or less their original form. The authors of this report had no control over the terminology used and the quality of the information. Reports on rare taxa from highly unlikely locations and habitats that are not supported by a specimen are labeled as questionable in the ANHIC database, so this kind of information is not included in this report.]

SPECIES ON TRACKING LIST:

Barbarea orthoceras Ledeb. (American winter cress) S2 G5

1. BRIEF DESCRIPTION: *Barbarea orthoceras* is a tall biennial (sometimes perennial) forb of the mustard family (Brassicaceae [Cruciferae]). It grows from woody crowns on taproots (Kershaw et al. 2001) (thus we used individual plant counts to estimate population size in FGWPP).

2. DISTRIBUTION:
FGWPP – It was reported from the study area for the first time in 1984 by Peter Lee who collected a specimen near Fidler Point (ANHIC 2003). The 2001 study confirmed the previously known location and resulted in finding nine additional locations of this species: five along the shore of Lake Athabasca (one of these just outside the park's west boundary), three on Burntwood Island, and one on Bustard Island (see Figure 2C).

AB – This species was first found on the north shore of Lake Athabasca in 1932 when early explorers, H.M. Raup and E.C. Abbe, collected a specimen on the shore of Sand Point (ca 23 km SW of the study area). Another collection from the general area dates back to 1969 when J.K. Whitehorn collected a specimen just east of Fort Chipewyan. *Barbarea orthoceras* is also known from four locations on the Caribou Mountains, and many locations further south, 10 of which are spread out through the northern and western part of the province. The remaining 16 locations are clustered in two southern areas, three being in the Waterton Lakes area, and 13 on Cypress Hills (Cypress Hills Provincial Park). In Alberta, locations of *Barbarea orthoceras* fall into the Dry Mixedwood, Boreal Highlands, Sub-Arctic, Montane, Upper Foothills, Foothills Parkland, Lower Foothills and Athabasca Plain natural subregions (see Figure 2B).

Global – In North America, this species has been reported from all Canadian provinces and territories (except Nunavut and Nova Scotia) and from 19 (mainly western) states. It is found as far north as Alaska, and as far south as Arizona and New Mexico (NatureServe 2003). *Barbarea orthoceras* is considered common in most Canadian provinces, but in addition to Alberta, it is rare in New Brunswick (S1S2) and Newfoundland Island (Newfoundland) (S1S2) (NatureServe 2003).

3. HABITAT:
FGWPP – Peter Lee (1984) found *Barbarea orthoceras* growing on banks and in moist woods. During the 2001 study it was found growing in somewhat protected sandy bays on moist sands, often between cobbles. Although it usually grew in isolation from other species it was sometimes found in the vicinity of *Carex lenticularis* var. *lipocarpa*, *Epilobium ciliatum*, *Primula mistassinica*, *Senecio congestus*, and some of the other provincially rare species such as *Sagina nodosa*, *Juncus filiformis* and *Hypericum majus*.

AB – J.K. Whitehorn collected a specimen from a rocky shore on the north side of Lake Athabasca. Kershaw et al. (2001) reported that *Barbarea orthoceras* occupies streambanks, wet meadows and moist woods in Alberta. It was also reported from sandy lake beaches (ANHIC 2003).

Elsewhere – Kershaw et al. (2001) noted that *B. orthoceras* occupies sand bars and rocky cliffs outside Alberta. In British Columbia, it grows on moist streambanks, in meadows and forests in the lowland, steppe and montane zones (Douglas et al. 1998b). Scoggan (1978-79) noted that it occupies streambanks, swampgrounds and wet rocks. According to the Flora of North America (FNA 1993), this species grows in dry fields, marshes, bogs, swamps and roadside ditches.

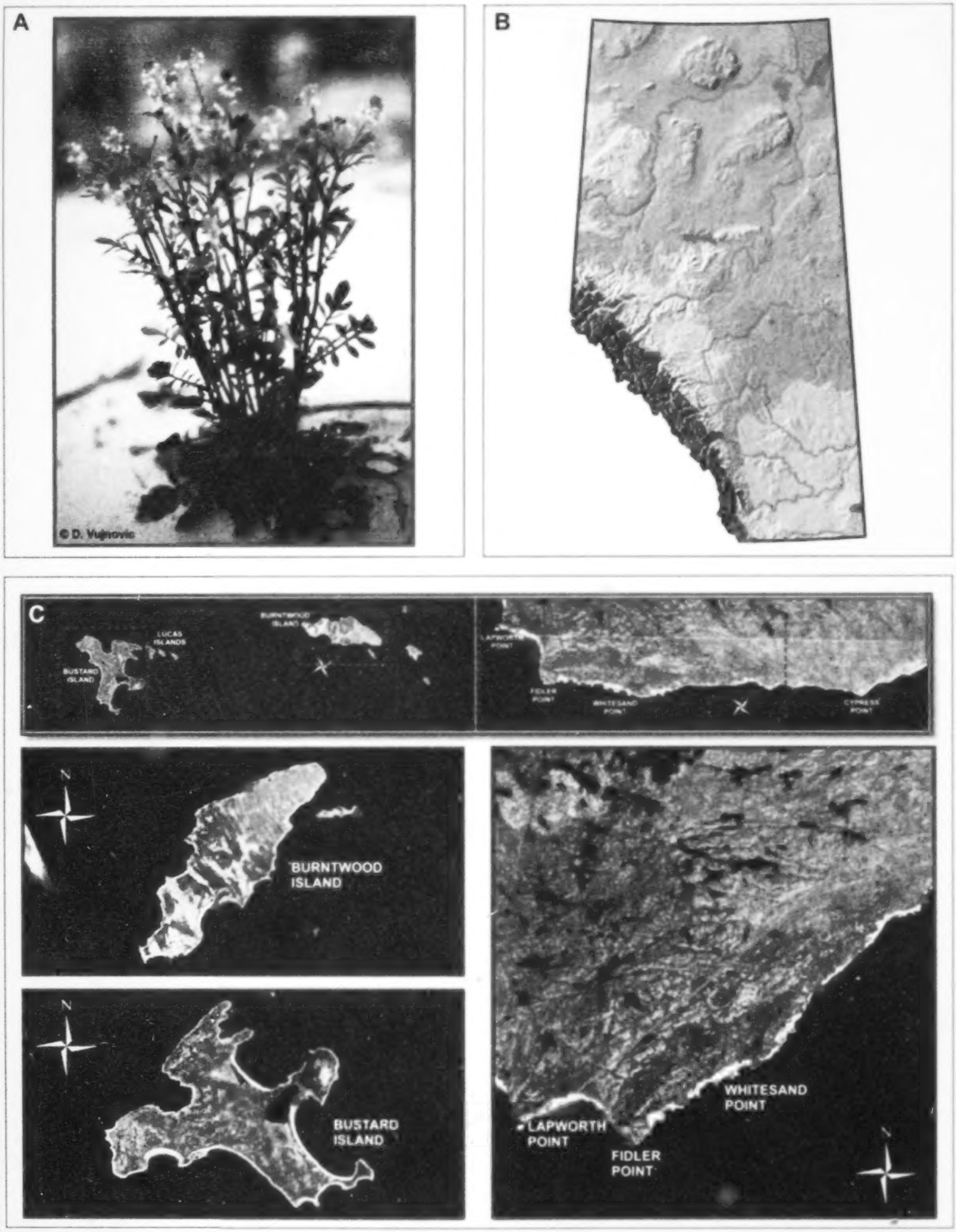
4. POPULATION SIZE:
FGWPP – Overall population size of *B. orthoceras* within the surveyed area of the mainland is estimated to be about 50 plants. A few 100s of plants were estimated at the location on a small unnamed island, just east of Burntwood Island, with only four plants found in the two locations on Burntwood Island and in one location on Bustard Island.

AB – Information on population size is not available for many locations outside the study area. The population on Cypress Hills measured approximately 2280 plants in 1999 and 32 plants have been reported from four locations on the Caribou Mountains. Only five plants were reported from a location at Vandersteene Lake (ANHIC 2003). All of the other occurrences lack population size information; most are known from historic information (older than 20 years).

5. PROTECTED AREAS: Caribou Mountains and Fidler-Greywillow Wildland Provincial Parks (WPPs); William A. Switzer and Cypress Hills Provincial Parks (PPs); Waterton Lakes National Park (NP).

6. NOTES: The other known locations of this species along the northern shore of Lake Athabasca and ample suitable habitat within the region outside park's boundary suggest that additional locations could be found within the region in the future.

Figure 2 *Barbarea orthoceras* Ledeb. (American winter cress). **A** - image of the plant; **B** - known locations of *Barbarea orthoceras* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.



A
© D. Vujnovic
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
N
BUSTARD ISLAND
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N

Botrychium simplex E. Hitchc. (dwarf grape fern) S2 G5

1. BRIEF DESCRIPTION: *Botrychium simplex* is a small perennial forb of the adder's-tongue (Ophioglossaceae) family. Like other members of the genus *Botrychium*, this species grows from a short erect rootstock and a cluster of fleshy roots (Moss 1983) (thus we used individual plant counts to estimate population size in FGWPP).

2. DISTRIBUTION:
FGWPP – The occurrence of *Botrychium simplex* at FGWPP is well north of its previously known range in Alberta. The closest confirmed occurrence was reported from Elk Island National Park, located some 600 km south from the study site. Only one location was found during this survey, situated in a somewhat protected sandy bay, not far from the water's edge (see figure 3C).

AB – This species has a fairly limited distribution in Alberta. In addition to the population from Elk Island National Park, it is known only from the Rocky Mountains (two locations in Banff and five in Waterton Lakes National Park) and from one location in the Cypress Hills. Known locations within the province fall within the Athabasca Plain, Dry Mixedwood, Montane, Sub-Alpine and Alpine natural subregions (see Figure 3B).

Global – *Botrychium simplex* is fairly widespread in North America, occurring at high elevations from California, east to Mississippi and North Carolina and as far north as Alaska and Newfoundland. It is known from all Canadian provinces and territories, except Yukon, Nunavut and Manitoba. In addition to Alberta, it is rare in British Columbia (S2S3), New Brunswick (S2), Newfoundland Island (Newfoundland) (S2), Nova Scotia (S2S3), Prince Edward Island (S1), Saskatchewan (S1), Colorado (S1), Connecticut (SH), Idaho (S2), Illinois (S1), Indiana (S1), Iowa (S1), Maryland (SH), North Carolina (S1), Ohio (SH), Rhode Island (S1), Utah (S1), Virginia (S1) and Wyoming (S2) (NatureServe 2003). McJannet et al. (1995) list *Botrychium simplex* as rare in the Northwest Territories.

3. HABITAT:
FGWPP – Plants grew in a somewhat protected sandy bay, not far from the shoreline, scattered on moist sand among cobbles. The few associated species included *Hypericum majus*, *Ranunculus reptans* and *Sagina nodosa*.

AB – In Alberta, *Botrychium simplex* grows in moist meadows and along the edges of wetlands (Kershaw et al. 2001). It grows on rock and shale slopes, in springy areas and in moist lodgepole pine forests (ANHIC 2003).

Elsewhere – *Botrychium simplex* can be found in dry fields and roadside ditches up to 2,200 m (Kershaw et al. 2001). Douglas et al. (2000) noted that it grows in moist to wet vernal pools and ephemeral seepages in the lowland and montane zones of British Columbia. Scoggan (1978-79) lists meadows, pastures and shores as known habitats for this species in Canada. Flora of North America (FNA 1993) notes that this species grows in marshes, bogs, swamps, dry fields and roadside ditches.

4. POPULATION SIZE:
FGWPP – The population consisted of about 100 plants scattered within the small area (ca 2 m by 2 m).

AB – Most locations in Waterton Lakes National Parks are known from historic reports that did not provide information on population size. Patrick Williston found only one plant at one of the locations in Waterton Lakes National Park and only 29 plants on the Cypress Hills in 2002 (ANHIC 2003). Population information is not available for the remaining locations within the province (historic reports).

5. PROTECTED AREAS: Waterton Lakes, Banff and Elk Island NPs; Cypress Hills PP; Fidler-Greywillow WPP. All known locations in the province fall within protected areas.

Figure 3 *Botrychium simplex* E. Hitchc. (dwarf grape fern). **A** - image of the plant; **B** - known locations of *Botrychium simplex* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

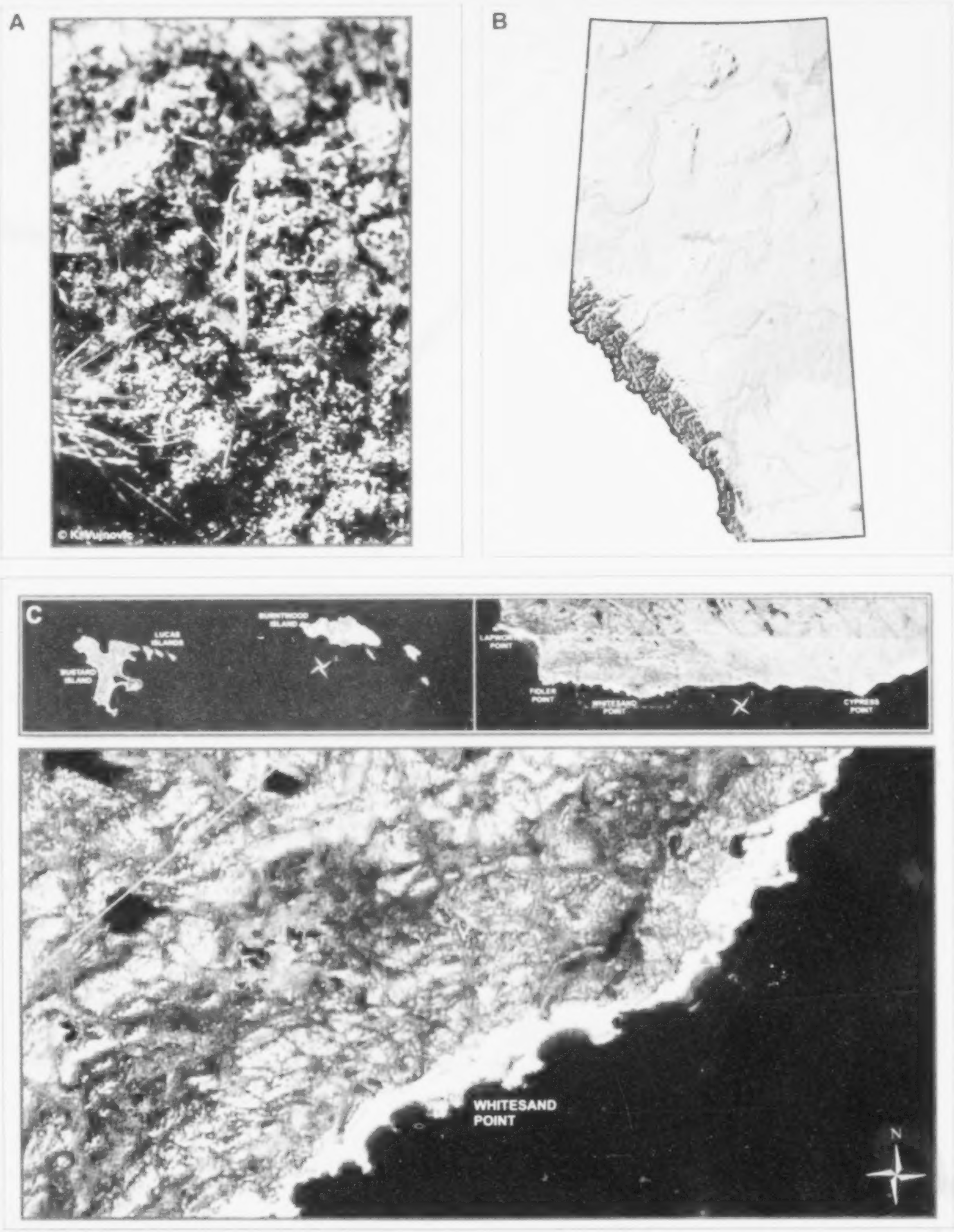
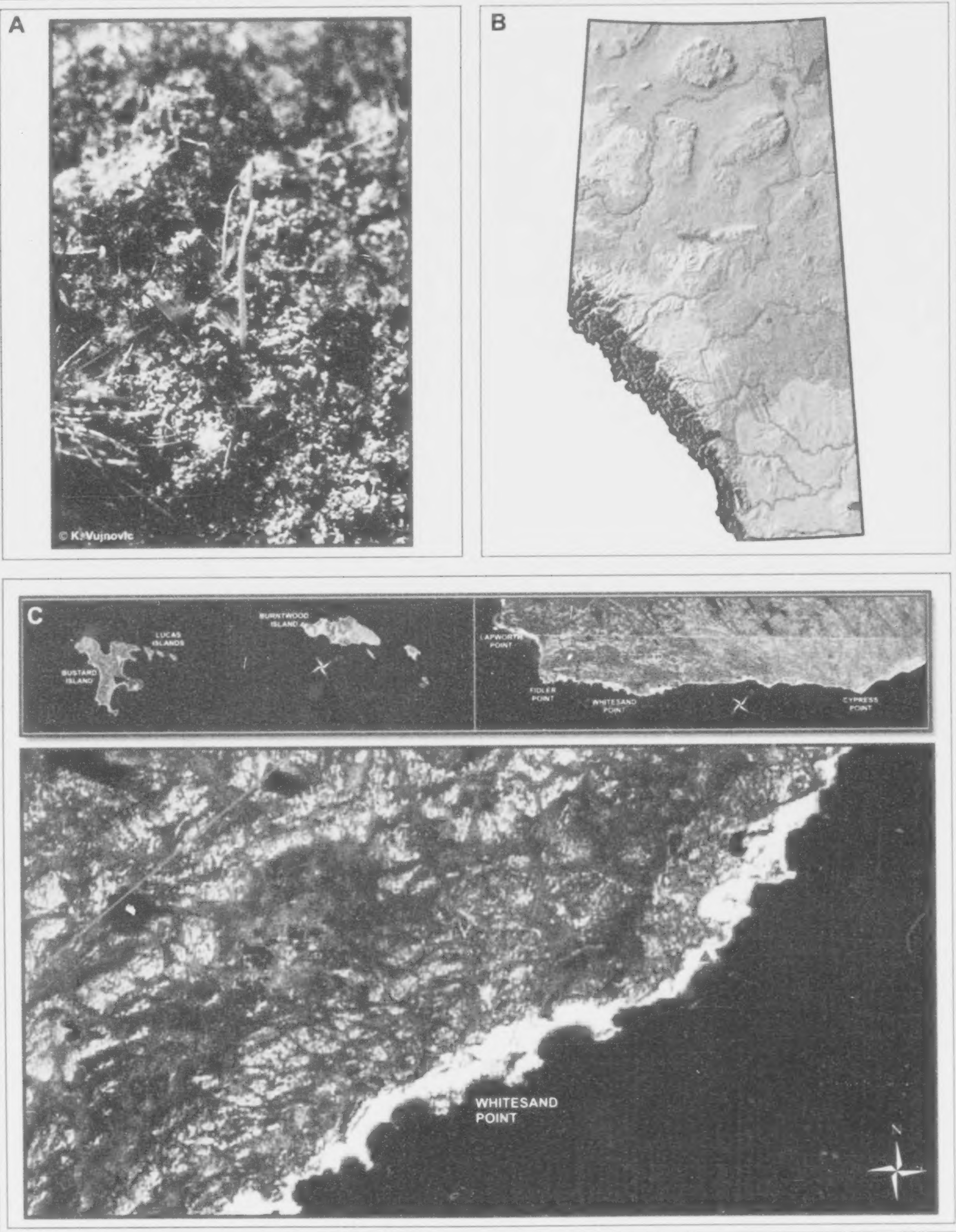

A
© K. Vujnovic
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
N

Figure 3 *Botrychium simplex* E. Hitchc. (dwarf grape fern). **A** - image of the plant; **B** - known locations of *Botrychium simplex* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© K. Vujnovic
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
N

Carex capitata L. (capitate sedge) S2 G5

1. BRIEF DESCRIPTION: *Carex capitata* is a tufted perennial herb of the sedge (Cyperaceae) family. It grows from a very short, ascending underground stem (Kershaw et al. 2001). In FGWPP this species was restricted to moist mossy patches in cracks of rock outcrops, which made a count of patches (versus count of individual plants) more practical for the purpose of estimating the population size of this taxon within the study area.

2. DISTRIBUTION:

FGWPP – Peter Lee reported finding this species in the study area (at Fidler Point) for the first time in 1984. It was found again during this 2001 reconnaissance survey only in the general area of Fidler Point, where it grew in four seemingly separate locations (300 to 900 m apart from each other) (see Figure 4C).

AB – Additional northern locations of this species in Alberta include one location each in La Butte Creek and Richardson River Dunes WPPs as well as some in the Ft. Fitzgerald area (4 locations) and one location in the Bistcho Lake Indian Reserve. *Carex capitata* is also known from 14 locations in the west-central part of Alberta. Known locations of *Carex capitata* in Alberta fall within Athabasca Plain, Kazan Upland, Central Mixedwood, Sub-Arctic, Peace River Lowlands, Alpine, Sub-Alpine, Montane, Upper Foothills and Lower Foothills natural subregions (see Figure 4B).

Global – *Carex capitata* is present throughout Canada (except in New Brunswick, Nova Scotia and Prince Edward Island) and the western half of the United States. It ranges as far north as Alaska and as far south as California and New Mexico. It is common in most Canadian provinces. In addition to Alberta, it is considered rare in Newfoundland Island (Newfoundland) (S1S2), Oregon (S2), Utah (S1) and Wyoming (S2) (NatureServe 2003).

3. HABITAT:

FGWPP – It typically grew on rock outcrops near shoreline, in small rock crevices where soil and mosses accumulate.

AB – In Alberta, this species generally grows in calcareous fens and other wet sites (Kershaw et al. 2001). It has been reported from willow-sedge wetlands, sloping riverbanks, alpine tundra and hillsides, and from fairly dry black spruce-lodgepole, black spruce and lodgepole pine dominated forests (often in forests on organic or sandy grounds) (ANHIC 2003)

Elsewhere – Outside Alberta, it can be found in moist meadows and shrubby open woods, often above treeline (Kershaw et al. 2001). In British Columbia, it is found in bogs and moist to dry, rocky slopes, streambanks and seepage slopes in the subalpine and alpine zones (Douglas et al. 2001a). It is described as growing on open tundra and slopes in Scoggan (1978-79). Flora of North America (FNA 2002) notes that this species grows in mires and heaths of the boreal forest, with disjunct occurrences southward in the alpine of eastern and western mountain ranges, mainly on calcareous substrates.

4. POPULATION SIZE:

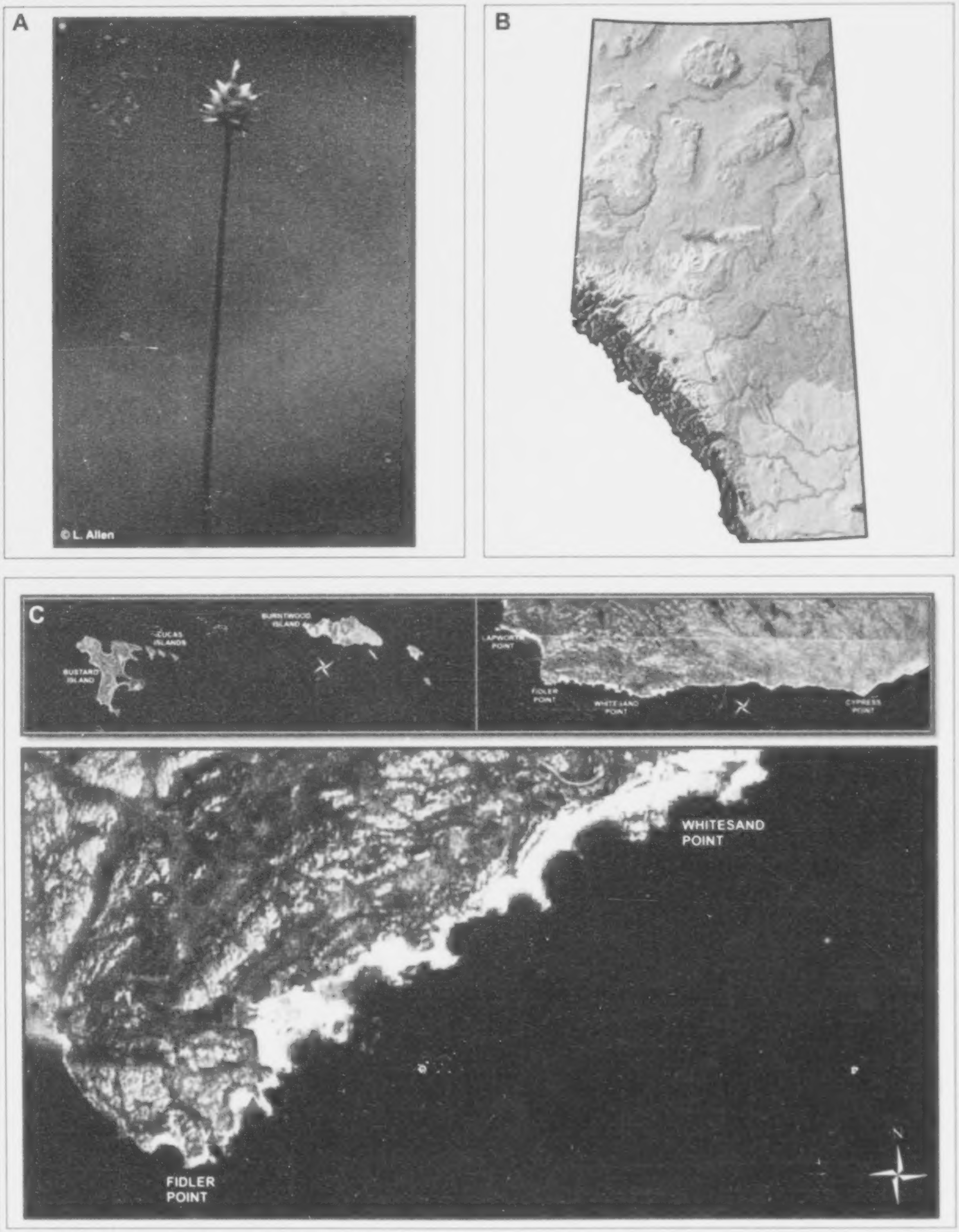
FGWPP – A dozen patches of various sizes (from 0.01 to 0.5 m^2) were observed in the study area.

AB – Several plants were observed in one location on Cardinal Divide and five patches have been reported from the location in La Butte Creek WPP (ANHIC 2003). Information on population size is not available for the rest of the known occurrences, most of which are based on historic records.

5. PROTECTED AREAS: Richardson River Dunes, La Butte Creek, Fidler-Greywillow and Whitehorse WPPs; Obed Lake and Sheep River PP; Lasthill Creek Natural Area (NA); Banff NP.

6. NOTES: The habitat of this species in FGWPP is unusual for the adjacent boreal region where it is mainly found in wetland habitats. The occurrences in moist cracks of rock outcrops are more typical for the mountainous portions of its range in Alberta.

Figure 4 *Carex capitata* L. (capitate sedge). **A** - image of the plant; **B** - known locations of *Carex capitata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT
N

Carex echinata Murr. ssp. *echinata* (little prickly sedge) S1 G5T5

1. BRIEF DESCRIPTION: *Carex echinata* Murr. ssp. *echinata* is a perennial, densely tufted herb of the sedge (Cyperaceae) family. It grows from fibrous roots (Douglas et al. 2001a) (thus we used individual plant counts to estimate population size in FGWPP).

2. DISTRIBUTION:

FGWPP – This survey provided the first record of *Carex echinata* ssp. *echinata* for Alberta. The species was noted in four locations; one just outside the western boundary of the park. Three sites were near shore on the mainland (separated from each other by 3.5 to 18.5 km) and the fourth one was on the shore of Burntwood Island (see Figure 5C).

AB – So far, *Carex echinata* Murr. ssp. *echinata* is known only from Fidler-Greywillow WPP situated within the Athabasca Plain Natural Subregion (see Figure5B).

Global – *Carex echinata* ssp. *echinata* is a circumpolar species, found north to Alaska, east to Newfoundland, and south to California, Tennessee and North Carolina. It grows in all Canadian provinces but is not known from any of the territories. It seems to be common in British Columbia and Ontario, but is considered rare in Saskatchewan (S1). It is also rare in Delaware (SH), Illinois (S1), Indiana (S1), Maryland (S1), Ohio (S1) and Wyoming (S1) (NatureServe 2003).

3. HABITAT:

FGWPP – It grew mainly on partially protected, moist sandy shore, with one or more of the following species: *Carex lenticularis* var. *lipocarpa*, *Juncus filiformis*, *Hypericum majus*, *Sagina nodosa*, *Primula mistassinica*, *Carex saxatilis* and *Salix planifolia*. One of the sites on the mainland can be described as *Salix* spp. – *Myrica gale*/*Carex* spp./*Scorpidium scorpioides* rich fen on sand.

AB – Same as above.

Elsewhere – In British Columbia, this species is known from bogs and wet sedge meadows, open forests, sandy lakeshores and streamsides in the lowland and montane zones (Douglas et al. 2001a). Scoggan (1978-79) notes that it grows on mossy or peaty soils and on shores. Flora of North America (FNA 2002) notes that this species grows in swamps, bogs, wet meadows, and on peaty or sandy shores of lakes or streams, generally in acidic soils.

4. POPULATION SIZE:

FGWPP – Only a few plants of *Carex echinata* ssp. *echinata* were found at each of the four locations and it seemed to be absent from most of the seemingly suitable habitat along the shoreline of the mainland and the two islands.

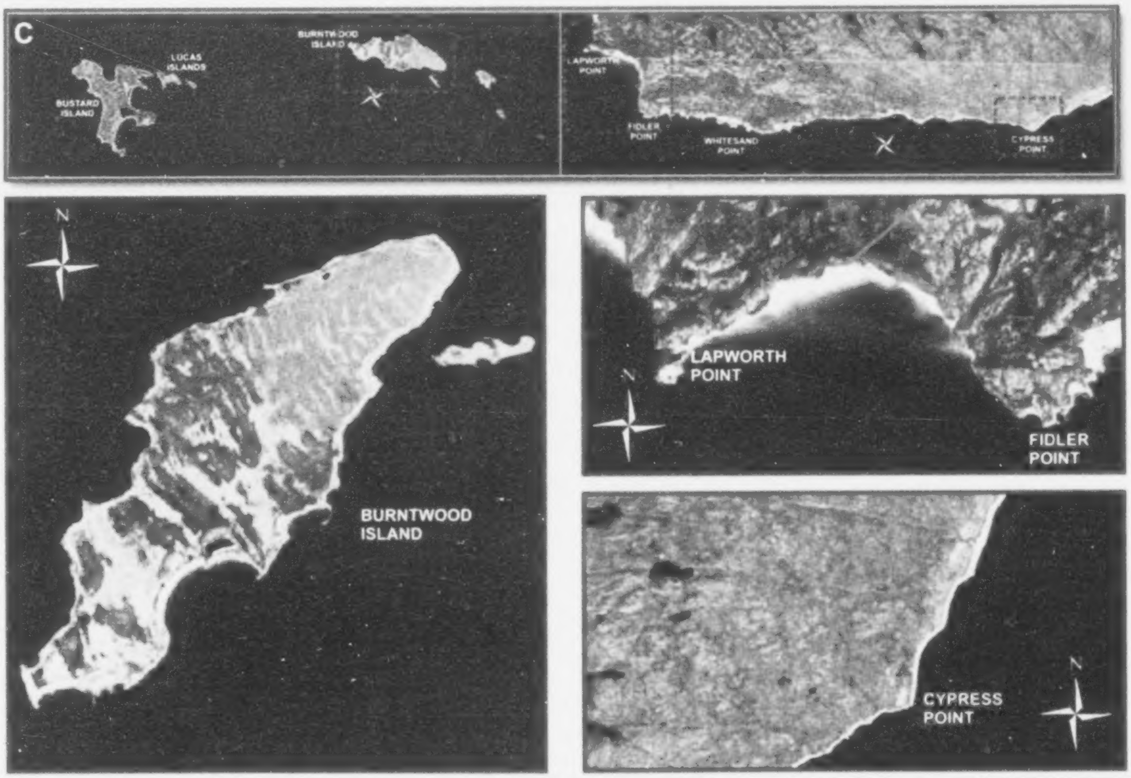
AB – Presently, there are no known populations of *C. echinata* ssp. *echinata* in Alberta outside the study area.

5. PROTECTED AREAS: Fidler-Greywillow WPP.

Figure 5 *Carex echinata* Murr. ssp. *echinata* (little prickly sedge). **A** - image of the plant; **B** - known locations of *Carex echinata* spp. *echinata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
N
LAPWORTH POINT
FIDLER POINT
N
CYPRESS POINT

Carex lenticularis var. *dolia* (M.E. Jones) L.A. Standley (lens-fruited sedge)

S1 G5T3Q

1. BRIEF DESCRIPTION: *Carex lenticularis* var. *dolia* is a perennial, densely clumped herb of the sedge (Cyperaceae) family. It grows from a short rhizome (Douglas et al. 2001a).

2. DISTRIBUTION:
FGWPP – One of the specimens of *Carex lenticularis* collected in Fidler-Greywillow area during the 2001 reconnaissance survey is being treated as *Carex lenticularis* var. *dolia* at the moment (see notes below). This specimen was collected from an area in between Fidler and Whitesand points (see Figure 6C).

AB – Typically a species of the Rocky Mountains within Alberta, *Carex lenticularis* var. *dolia* was previously reported from only one location in the Canadian Shield, just north of Colin Lake (collected by Cliff Wallis in 1983). Eight additional locations are known from three general areas in Banff and Jasper National Parks. Known locations of *Carex lenticularis* var. *dolia* in Alberta fall within the Alpine, Sub-Alpine, Montane, Athabasca Plain and Kazan Upland natural subregions (see Figure 6B).

Global – This variety seems to have a very restricted distribution globally (found in only five jurisdictions in North America), with possibly declining populations (NatureServe 2003). It is found from Alaska to Montana (Alaska (S3), Montana (S2) Alberta (S1), British Columbia (S2S3) and Yukon Territory (reported)) (NatureServe 2003).

3. HABITAT:
FGWPP – The specimen was collected from a *Carex limosa – Scheuchzeria palustris/Sphagnum angustifolium* poor fen located in a distinct depression just back from the north shore of Lake Athabasca. More information about this community type can be found in Allen et al. (2003b).

AB – In the Rocky Mountains of Alberta it grows on moist lakeshores and in marshes (Kershaw et al. 2001). ANHIC (2003) also lists dry alpine and subalpine slopes and screes as areas supporting this species.

Elsewhere – In British Columbia, it is found on streamsides and ponds of the sub-alpine and alpine zones (Douglas et al 2001a). Kershaw et al. (2001) noted that it also grows on river flats and streambanks. Scoggan (1978-79) suggested that it grows on rocky tundra and slopes. According to the Flora of North America (FNA 2002), this species grows on gravelly soils on seasonally flooded streams and lakeshores or seeps.

4. POPULATION SIZE:
FGWPP – Population size is not known because this specimen was properly identified only after the field work was completed (*Carex lenticularis* var. *lipocarpa* was also found at the same location).

AB – More than 20 clumps and between 100 and 200 plants were reported from two adjacent locations on Mt. Edith Cavell (Jasper National Park) (ANHIC 2003). Information on population size is not available for the rest of the known occurrences within the province, all of which are based on historic records.

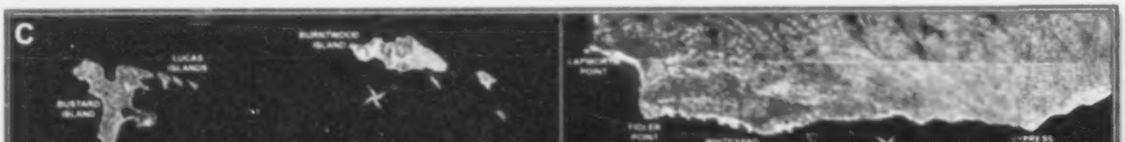
5. PROTECTED AREAS: Jasper and Banff NPs; Colin-Cornwall Lakes and Fidler-Greywillow WPPs.

6. NOTES: *Carex lenticularis* var. *dolia* was recognized as a distinct variety in Kartesz' 1994 checklist and 1999 Synthesis (Kartesz 1994, 1999), based on Lisa Standley's 1985 publication (Systematics of the Acutae group of Carex (Cyperaceae) in the Pacific Northwest, Syst. Bot. Monogr., vol. 7). D. Murray considers it to be a "Questionably distinct variety" (ANHIC 2003). Taxonomic treatment of this species is under review in Alberta (Gould, A.J., personal comm.). All three presently recognized varieties of *Carex lenticularis* in Alberta (var. *dolia*, var. *lenticularis* and var. *lipocarpa*) were found during this study in Fidler-Greywillow WPP.

Figure 6 *Carex lenticularis* var. *dolia* (M. E. Jones) L. A. Standley (lens-fruited sedge). **A** - image of the plant; **B** - known locations of *Carex lenticularis* var. *dolia* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
N

Carex lenticularis var. *lenticularis* S1 G5T5

1. BRIEF DESCRIPTION: *Carex lenticularis* var. *lenticularis* is a perennial, densely clumped herb of the sedge (Cyperaceae) family. It grows from a short rhizome (Douglas et al. 2001a).

2. DISTRIBUTION:
FGWPP - One of the specimens of *Carex lenticularis* collected from Fidler-Greywillow area during the 2001 reconnaissance survey was subsequently determined as *Carex lenticularis* var. *lenticularis*. It was collected on the south side of Burntwood Island (see Figure 7C).

AB - *Carex lenticularis* var. *lenticularis* is known from only one additional location in Alberta, from an island in Wylie Lake (collected by C. Wallis in 1983). Known locations fall within the Kazan Upland and Athabasca plain natural subregions (see Figure 7B).

Global - This variety is known from most Canadian provinces and territories (with the exception of Yukon, Nunavut and Prince Edward Island) and nine neighboring states (from Washington on the west to Massachusetts on the east); it seems to be common in eastern Canada, but is considered rare in British Columbia (S2) (NatureServe 2003).

3. HABITAT:
FGWPP - The plant was growing in a shallow bay, on moist sands among cobbles, with *Epilobium ciliatum*, *Carex lenticularis var. lipocarpa*, *Senecio congestus* and some provincially rare species such as *Rhynchospora capillacea*, *Juncus filiformis*, *Hypericum majus* and *Sagina nodosa*.

AB - It was found on the shore of a sheltered bay at Wylie Lake.

Elsewhere - In British Columbia, *Carex lenticularis* var. *lenticularis* is found in wet meadows, on sandy beaches and marsh edges in the lowland zone (Douglas et al 2001a). Scoggan (1978-79) noted that it grew in meadows, swampy grounds and on shores. According to the Flora of North America (FNA 2002) it grows on seasonally flooded river and lakeshores.

4. POPULATION SIZE:
FGWPP - Since it was not recognized as a distinct variety during the fieldwork, no estimation of the population size for this location is available at the moment.

AB - There is no information on population size at Wylie Lake.

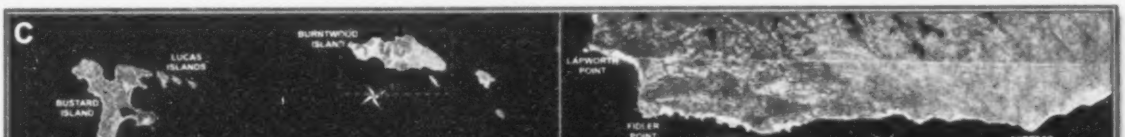
5. PROTECTED AREAS: Fidler-Greywillow WPP.

6. NOTES: *Carex lenticularis* var. *lenticularis* was recognized as a distinct variety in Kartesz' 1994 checklist and 1999 Synthesis (Kartesz 1994, 1999), based on Lisa Standley's 1985 publication (Systematics of the Acutae group of Carex (Cyperaceae) in the Pacific Northwest, Syst. Bot. Monogr., vol. 7). D. Murray considers it to be a "Questionably distinct variety" (ANHIC 2003). Taxonomic treatment of this species is under review in Alberta (Gould, A.J., personal comm.). All three presently recognized varieties of *Carex lenticularis* in Alberta (var. *dolia*, var. *lenticularis* and var. *lipocarpa*) were found during this study in Fidler-Greywillow WPP.

Figure 7 *Carex lenticularis* var. *lenticularis*. **A** - image of the plant; **B** - known locations of *Carex lenticularis* var. *lenticularis* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
BURNTWOOD ISLAND
N

Carex oligosperma Michx. (few-fruited sedge) S1S2 G4

1. BRIEF DESCRIPTION: *Carex oligosperma* is a perennial herb of the sedge (Cyperaceae) family. It grows from scaly underground stems (rhizomes) (Douglas et al. 2001a). The reproduction from rhizomes made it difficult to estimate the number of individuals on sites, so the number of "plants" was estimated for very small groupings of plants, or an area occupied by this taxon was estimated instead to approximate population size within the study area.

2. DISTRIBUTION:
FGWPP – Peter Lee collected a specimen near Fidler Point in 1984. During the 2001 survey, it was found in only one general area, not far from Fidler Point (see figure 8C).

AB – Elsewhere in Alberta, this species is known from Crow Lake (the southernmost location in the province), Richardson River Dunes WPP area (two locations) and Muskeg Mountain northeast of Fort McMurray (two locations). Currently know locations of this species in Alberta fall within Central Mixedwood and Athabasca Plain natural subregions (see Figure 8B).

Global – It is known from all Canadian provinces and territories except Yukon and British Columbia. It is also present in the eastern states, as far south as Nebraska, Illinois and North Carolina. It is considered rare in Illinois (S1), Massachusetts (S1), North Carolina (S1), Ohio (S2) and Pennsylvania (S2) (NatureServe 2003). Alberta's populations seem to be on the western edge of its distribution range.

3. HABITAT:
FGWPP – Plants were growing in two small adjacent sandy basins behind a beach ridge. In one of the two basins *Carex oligosperma* was co-dominant with another rare species, *Carex rostrata*. This *Carex oligosperma – Carex rostrata/Sphagnum angustifolium* poor fen was described in more detail by Allen et al. (2003b). In the second (smaller) basin, *Carex oligosperma* grew as scattered plants in a *Carex limosa – Scheuchzeria palustris/Sphagnum angustifolium* poor fen (also described in Allen et al. 2003b).

AB – Often found in fens with black spruce, larch and sphagnum mosses. In Richardson River Dunes WPP, it grew in two distinct areas. One was in the central portion of a channel fen and the second was a series of fens, enclosed in a parabolic dune. Both areas had sandy substrate with the water table near the surface (ANHIC 2003). Kershaw et al. (2001) noted that it grows in wet meadows and bogs.

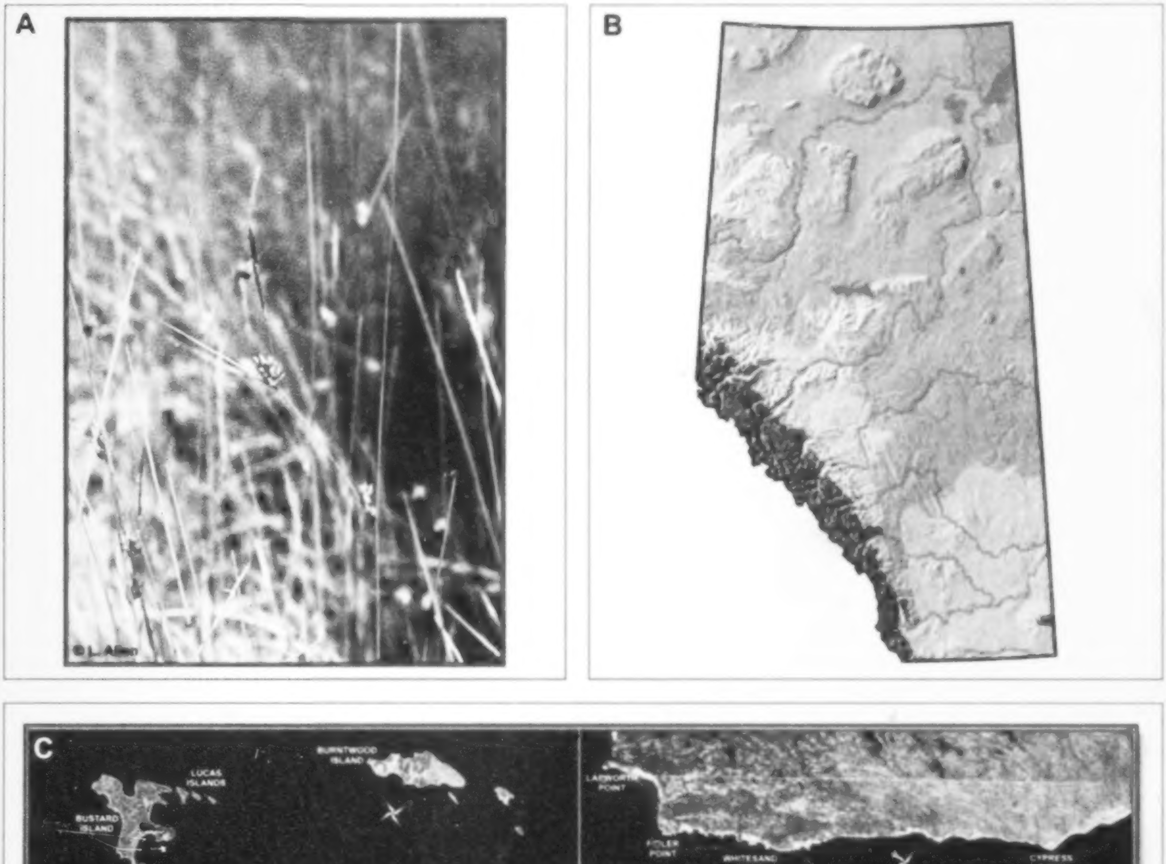
Elsewhere – According to Scoggan (1978-79), it grows in peat bogs, acid swamps, and shallow water. Flora of North America (FNA 2002) notes that this species grows in bogs, poor fens, and sometimes in acidic, sandy, or peaty soils in open swamps, marshes, lakeshores and riverbanks.

4. POPULATION SIZE:
FGWPP – *Carex oligosperma* was a co-dominant species within an area of about 22 m^2. Only a few scattered "plants" were found in the adjacent *Carex limosa – Scheuchzeria palustris/Sphagnum angustifolium* poor fen.

AB – The populations from two adjacent locations on Muskeg Mountain seem to be relatively extensive. Cover values of *Carex oligosperma* estimated in ten vegetation plots within an area of about 150 ha ranged from less than 1% to about 30 %. At Richardson River Dunes WPP, this species dominated two sites: the central portion of a channel fen that covered about one hectare and a series of fens covering approximately 11.2 hectares. No size estimate was available for the Crow Lake population (ANHIC 2003).

5. PROTECTED AREAS: Richardson River Dunes and Fidler-Greywillow WPPs.

Figure 8 *Carex oligosperma* Michx. (few-fruited sedge). **A** - image of the plant; **B** - known locations of *Carex oligosperma* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LADWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT
N

Carex rostrata Stokes (beaked sedge) S2 G5

1. BRIEF DESCRIPTION: *Carex rostrata* is a stout, clumped perennial herb of the sedge (Cyperaceae) family. It grows from short creeping rhizomes (Douglas et al. 2001a). The reproduction from rhizomes made it difficult to estimate number of individuals on sites, so the number of "plants" or an area occupied by this taxon was estimated for approximation of population size within the study area.

2. DISTRIBUTION:

FGWPP - Fairbarns et al. (1984) reported finding *Carex rostrata* at Fidler Point in 1984. However, it is not clear if this report refers to true *Carex rostrata*, which wasn't at the time distinguished from the more common *Carex utriculata* in Alberta's literature (see "Notes" below for further explanation). Unfortunately, a voucher specimen was not collected in 1984 to allow for verification of the name. In 2001, true *Carex rostrata* was found in three general areas of the park: one on Burntwood Island and two northeast of Fidler Point (see figure 9C).

AB - *Carex rostrata* was reported from more than 20 areas in the northeastern and central parts of the province; the southernmost location was found in the Rocky Mountain House area. Presently known locations of this species in Alberta fall within the Central Mixedwood, Dry Mixedwood, Peace River Lowland, Sub-Arctic, Upper Foothills, Lower Foothills, Athabasca Plain and Kazan Upland natural subregions (see Figure 9B).

Global - This circumpolar species has been reported from all Canadian Provinces and Territories and numerous states. Its range extends northwest to Alaska, northeast to Newfoundland, south and southwest to California, Arizona and New Mexico, and southeast to Tennessee and Virginia. In addition to Alberta, it is considered rare in British Columbia (S2S3), New Brunswick (S1S2), Nova Scotia (S1?), Prince Edward Island (S1), Washington (S1), Montana (S1), Idaho (S2), Illinois (S2), Ohio (S2), Virginia (S1) and Tennessee (S1) (NatureServe 2003).

3. HABITAT:

FGWPP - On Burntwood Island, *Carex rostrata* grew in a floating fen situated behind a sandy ridge on the south shore of the island. The fen was dominated by *Carex lasiocarpa*, *Equisetum fluviatile*, *Drosera rotundifolia*, *Drosera anglica* and *Menyanthes trifoliata*. On the mainland, *Carex rostrata* was found in five poor fens characterized by the co-dominance of a number of different species. In three cases *Carex rostrata* was a co-dominant species: *Carex lasiocarpa – Carex rostrata*, *Carex rostrata – Carex chordorrhiza/Warnstorfia exannulata*, and *Carex oligosperma – Carex rostrata/Sphagnum angustifolium* fens. It also occurred as scattered plants in a *Carex limosa – Scheuchzeria palustris/Sphagnum angustifolium* poor fen. More information on these communities can be found in Allen et al. (2003b).

AB - It generally grows in floating fens and at the edges of ponds and lakes in Alberta (Kershaw et al. 2001). It is also found in shallow water at the edge of lakes and channels with a sandy bottom, in willow thickets, in poor to rich string fens, and in pockets of perched bogs of subarctic woodlands (ANHIC 2003). *Carex rostrata* is often reported as associated with *Carex lasiocarpa* (ANHIC 2003).

Elsewhere - In British Columbia it is found in bogs in the montane and subalpine zones (Douglas et al. 2001a). Scoggan (1978-79) noted that it grows in swamps, on wet shores and in shallow water. According to the Flora of North America (FNA 2002), it grows in flarks in bogs and bog pools, patterned fens, lake and stream shores, often in shallow water or on floating mats.

4. POPULATION SIZE:

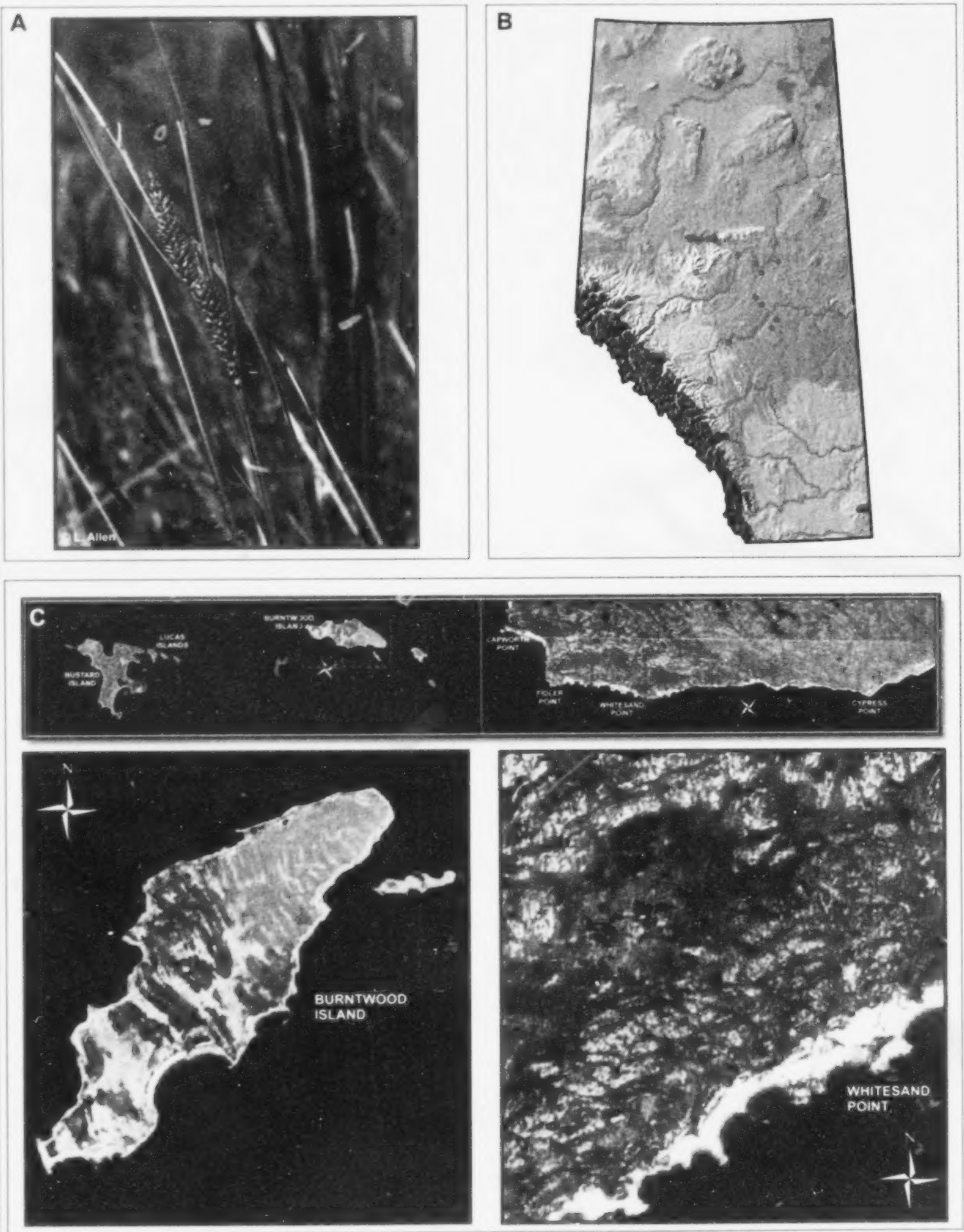
FGWPP - *Carex rostrata* grew sporadically at one location on Burntwood Island. In the three mainland fens, *Carex rostrata* was a co-dominant species. In the *Carex lasiocarpa–Carex rostrata* wetland a couple of 100s of "plants" were estimated (*Carex lasiocarpa* to *Carex rostrata* ratio was ca 9 to 1). The *Carex rostrata – Carex chordorrhiza/Warnstorfia exannulata* community occupied an area of about 0.2 ha and in the *Carex oligosperma – Carex rostrata/Sphagnum angustifolium* community, *Carex rostrata* dominated in an area of about 0.02 ha.

AB – This species was described as locally abundant at the location in Elk Island National Park. About 100 plants have been reported from the Bennett Lake location and in locations at Coyote Lake, *Carex rostrata* cover ranged from less than 1% to up to 15% in 20x20m sampling plots. Thousands of plants have been estimated at locations within Colin-Cornwall Lakes WPP and a couple of 100s at one location on the Caribou Mountains (ANHIC 2003). Other reported locations within the province either had very few plants or were based on historic records, in which case there is no information on population size available.

5. PROTECTED AREAS: Colin-Cornwall Lakes, La Butte Creek, Caribou Mountains, La Biche River and Fidler-Greywillow WPPs; Athabasca Dunes Ecological Reserve (ER); Hondo, Clyde Fen, Coyote Lake and Halfmoon Lake NAs; Elk Island NP.

7. NOTES: *Carex rostrata* resembles bottle sedge (*Carex utriculata* Boott), one of the most common sedges in Alberta. Their co-existence in our province was not recognized until after the last revision of Flora of Alberta (Moss 1983) when a paper on "The true *Carex rostrata* (Cyperaceae) in Alberta" was published in 1989 by Dr. Graham Griffiths (Griffiths 1989). Many field botanists are not aware that the species called *Carex rostrata* in the Flora of Alberta is actually *Carex utriculata*, so reports of *C. rostrata* need to be reviewed carefully. Wetlands reported to be dominated by *Carex rostrata* are potentially dominated by *Carex utriculata* instead. Careful examination of plants needs to be done by the practitioners in the field to better assess the real abundance and distribution of *Carex rostrata*.

Figure 9 *Carex rostrata* Stokes (baked sedge). **A** - image of the plant; **B** - known locations of *Carex rostrata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
L. Allen
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
CAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
N

Carex supina Willd. ex Wahlenb. (weak sedge) S1 G5

1. BRIEF DESCRIPTION: *Carex supina* is a loosely tufted perennial herb of the sedge (Cyperaceae) family. It grows from slender underground runners (stolons) (Kershaw et al. 2001) (thus we counted a number of "plants" to estimate population size for this species in FGWPP).

2. DISTRIBUTION:
FGWPP – During the 2001 reconnaissance survey, *Carex supina* was found at only one location, just outside the park's western boundary (see figure 10C).

AB – Cliff Wallis found *Carex supina* at one location at Colin Lake (approximately 40 km north of the study site) in 1983. It was found again in the same location in 2003, along with three additional locations in Colin-Cornwall Lakes WPP (ANHIC 2003). This species has also been reported from Windy Point (Jasper National Park), but the report is based on only one vegetative specimen collected by D. Flook in 1951, and therefore has a high degree of uncertainty associated with it. Confirmed locations of this species in Alberta fall within the Athabasca Plain and Kazan Upland natural subregions (see Figure 10B).

Global – This circumpolar species is known from almost all Canadian provinces and territories (except the Maritimes). In addition to Alberta, it is considered rare in Saskatchewan (S1), Manitoba (S2?) and Ontario (S1). In the United States, this species extends only into Minnesota (NatureServe 2003). *Carex supina* is also known from Greenland and Eurasia (Douglas et al. 2001a).

3. HABITAT:
FGWPP – It grew on a small south facing slope above the shoreline dominated by *Carex siccata* and various lichen species (*Cladina, Cladonia*).

AB – Kershaw et al. (2001) noted that *Carex supina* grows on dry, gravelly, eroding slopes and sandy sites in Alberta.

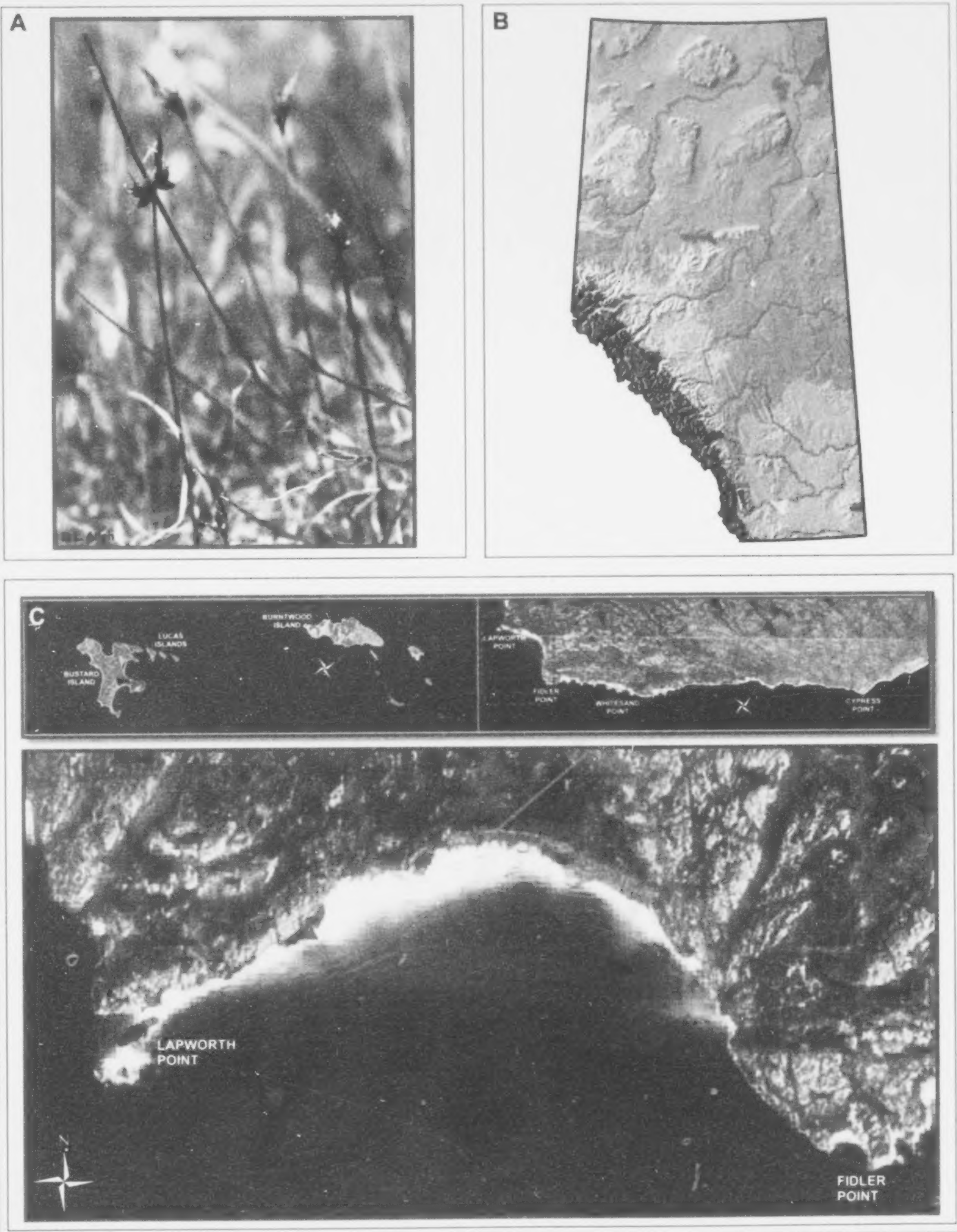
Elsewhere – It is also known from dry rocky or sandy, grassy slopes and rock outcrops in the montane zones of British Columbia (Douglas et al. 2001a). Scoggan (1978-79) notes that it grows on acidic rocks and sands. Flora of North America (FNA 2002) describes the habitat of this species as dry meadows and bluffs, rock outcrops, and sandy soil on lakeshores and floodplains.

4. POPULATION SIZE:
FGWPP – Only a few "plants" were found at the location just west of Fidler-Greywillow WPP.

AB – Roughly eight thousand plants were estimated at one location in Colin-Cornwall WPP and up to one thousand clumps were estimated within the other three locations in total.

5. PROTECTED AREAS: Colin-Cornwall Lakes WPP and just west of Fidler-Greywillow WPP.

Figure 10 *Carex supina* Willd. ex Wahlenb. (weak sedge). **A** - image of the plant; **B** - known locations of *Carex supina* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
LAPWORTH POINT
FIDLER POINT

Carex umbellata Schkuhr ex Willd. (umbellate sedge) S1 G5

1. BRIEF DESCRIPTION: *Carex umbellata* is a small, tufted, almost stemless perennial herb of the sedge (Cyperaceae) family. It grows from slender, scaly rhizomes (Douglas et al. 2001a). In FGWPP this taxon exhibited a low, dense growth in patches embedded in cracks of rock outcrops, which made a count of individual plants impractical, thus the number and size of patches were noted to estimate the population size of this taxon within the study area.

2. DISTRIBUTION:
FGWPP - During the 2001 survey, *Carex umbellata* was found growing in seven locations: six just northeast of Fidler Point, separated by not more than about 1500 m from each other, and one on Burntwood Island (see map 11C).

AB - Prior to this study, *Carex umbellata* was known from only two areas within the Canadian Shield in Alberta: from Colin Lake (specimen collection by Cliff Wallis in 1983) and Andrew Lake (specimen collection by R. Hastings and R.A. Ellis in 1988). The species has been re-found at Colin Lake (in Colin-Cornwall Lakes WPP) and new locations were discovered within La Butte Creek WPP (ANHIC 2003). The only two locations outside the Canadian Shield are found at Gaetz Lake and in the Fox Creek Area (ANHIC 2003). Currently known locations of this species in Alberta fall within the Lower Foothills, Athabasca Plain, Kazan Upland and Central Parkland natural subregions (see Figure 11B).

Global - *Carex umbellata* is known from all Canadian provinces and from Nunavut, as well as from most of the states within the eastern half of the continent. In addition to Alberta, this species is considered rare in Labrador (S1S2), Newfoundland Island (Newfoundland) (S1S2), Iowa (S1), Nebraska (S1) and North Carolina (S1S2) (NatureServe 2003).

3. HABITAT:
FGWPP - It was typically found on rock outcrops situated along the shore or in open jack pine forest. It grew in cracks of rock where soil and moisture accumulate to provide a suitable microhabitat for growth of this species and associated species such as *Potentilla multifida*, *Huperzia selago*, *Carex siccata*, *Cryptogramma acrostichoides*, *Woodsia ilvensis* and *Festuca saximontana*.

AB - In other locations within the Canadian Shield, it occupied similar habitats as in Fidler-Greywillow WPP, except at one area in Colin-Cornwall Lakes WPP where it grows on a steep, unstable graminoid slope (ANHIC 2003). Outside the Canadian Shield, this species was reported growing in a dry aspen stand at Gaetz Lake (collection by P. McIsaac and D. Mussell from 1979) and in *Pinus contorta – Ledum groenlandicum* woods in the Fox Creek area (collection by J.D. Johnson from 1977)(ANHIC 2003).

Elsewhere - As noted in Scoggan (1978-79), it is known from sandy ground, dry sterile fields, and open woods. Flora of North America (FNA 2002) notes a wide variety of habitats: open, dry to mesic, circumneutral to calcareous, rocky, sandy, and clayey fields, pastures, tall-grass prairies, glades, ridges, bluffs, slopes, barrens, dunes, open deciduous and mixed woodlands, and also on basalt and serpentine.

4. POPULATION SIZE:
FGWPP - Only a few patches of *Carex umbellata* have been seen at each location within the study site.

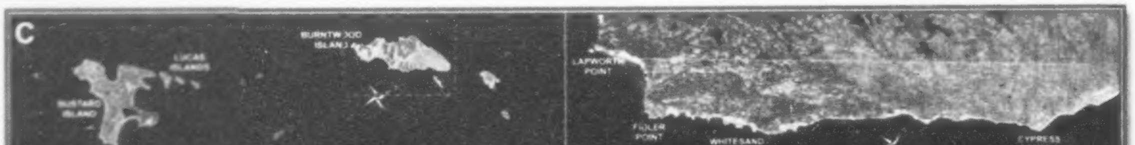
AB - Only a few scattered clumps of *Carex umbellata* have been observed at each of the locations within the Canadian Shield Natural Region (ANHIC 2003). Information on population size is not available for the two locations outside the Canadian Shield (historic records).

5. PROTECTED AREAS: La Butte Creek, Colin-Cornwall Lakes and Fidler-Greywillow WPPs.

Figure 11 *Carex umbellata* Schkuhr ex Willd. (umbellate sedge). **A** - image of the plant; **B** - known locations of *Carex umbellata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


C
LUCAS ISLANDS
BUSTARD ISLAND
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
N
FIDLER POINT

Danthonia spicata (L.) Beauv. ex Roemer & J.A. Schultes (poverty oat grass)

S1S2 G5

1. BRIEF DESCRIPTION: *Danthonia spicata* is a tufted perennial herb of the grass (Poaceae [Gramineae]) family. It grows from fibrous roots, which made a count/estimation of plant numbers a method of choice for the approximation of population size within the study area.

2. DISTRIBUTION:
FGWPP – During the 2001 survey, *Danthonia spicata* was found growing in three separate locations: two within the park and one just outside the park's western boundary (see Figure 12C).

AB – The first record of this species from the Canadian Shield in Alberta dates back to 1932 when H.M. Raup and E.C. Abbe collected a specimen from a rocky jack pine ridge at Sand Point, some 23 km southwest of the study site. Outside the Canadian Shield in Alberta, *Danthonia spicata* is found at nine locations within the central part of Alberta, as far east as the Cold Lake area and as far west as the Athabasca Valley, Jasper National Park (ANHIC 2003). Presently known locations of this species in Alberta fall within the Central Mixedwood, Dry Mixedwood, Montane, Athabasca Plain and Central Parkland natural subregions (see Figure 12B).

Global – *Danthonia spicata* has a widespread distribution in North America (but is not reported from Nunavut in Canada) and is considered rare only in Alberta and Alaska (S1) (NatureServe 2003). It was also listed as rare in the Northwest Territories (McJannet et al. 1995; the Northwest Territories does not have a Conservation Data Centre to provide NatureServe with species status, so McJannet et al. 1995 represents the best available information on rare vascular plants within this jurisdiction).

3. HABITAT:
FGWPP – It grew on sandy ground in one small opening of a jack pine forest, and on drier areas of sandy beaches. Some of the associated species from the beach locations included *Betula papyrifera*, *Sisyrinchium montanum*, *Tanacetum bipinnatum* ssp. *huronense*, *Vaccinium uliginosum* and *Leymus mollis*.

AB – Kershaw et al. (2001) noted that it grows on sandy and rocky sites, mostly in dry woods, but sometimes in moist meadows. ANHIC (2003) adds marly-silty riverbanks and calcareous fens to the list of habitats noted in Kershaw et al. (2001).

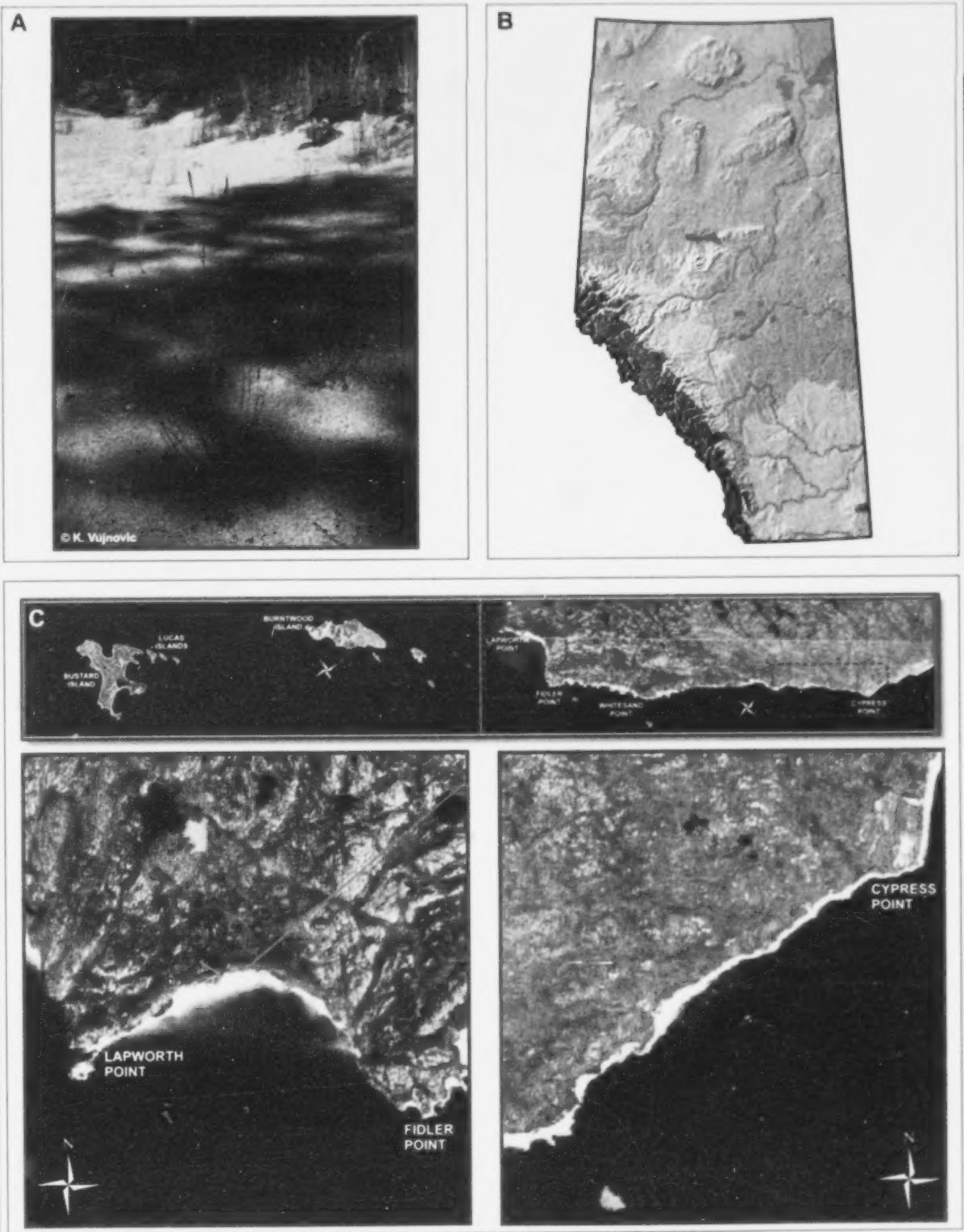
Elsewhere – It can also be found on rock outcrops and in dry prairie (Kershaw et al. 2001). In British Columbia it grows on dry shorelines, and in open forests and meadows in the lowland and montane zones (Douglas et al. 2001b). Scoggan (1978-79) reports that it grows on sterile rocky or sandy open soil and in thin woodlands.

4. POPULATION SIZE:
FGWPP – At the two western locations observed during the 2001 survey, nine plants were found at one site and one plant at the other. The biggest population was found in the easternmost location within the park, containing approximately 100 plants of *Danthonia spicata*.

AB – About one hundred plants were reported from four locations in central Alberta (ANHIC 2003). Information on population size is not available from other locations, many of which are based on historic collections.

5. PROTECTED AREAS: Jasper NP; Halfmoon Lake NA; Cold Lake PP; Fidler-Greywillow WPP.

Figure 12 *Danthonia spicata* (L.) Beauv. ex Roemer & J. A. Schultes (poverty oat grass). **A** - image of the plant; **B** - known locations of *Danthonia spicata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© K. Vujnovic
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
LAPWORTH POINT
FIDLER POINT
N
CYPRESS POINT
N

Gymnocarpium jessoense (Koidzumi) Koidzumi (northern oak fern) S1 G5

1. BRIEF DESCRIPTION: *Gymnocarpium jessoense* is a delicate forb of the woodfern (Dryopteridaceae [Polypodiaceae]) family. It grows from slender creeping underground stems (rhizomes) (Kershaw et al. 2001), thus a small clump of half a dozen fronds found during this study was considered to belong to a single individual.

2. DISTRIBUTION:
FGWPP – During the 2001 field survey of the Fidler-Greywillow study site, *Gymnocarpium jessoense* was found at only one location, about 3.5 km northeast of Fidler Point (see Figure 13C).

AB – In the Canadian Shield of Alberta, this species was previously known from only one area in the Wylie Lake area, situated approximately 25 km north of the study site (collection by C. Wallis and C. Wershler from 1983). Outside the Canadian Shield, this species is also known from Whitemud Falls ER (ANHIC 2003) and in the northern Rocky Mountains (dot on map in Cody and Britton 1989). It may also occur in the Sergeant Creek area (northwest of Grande Prairie) (collection by L.K. Ennset al. in 1991, but there are some doubts about the identification). In Alberta, known sites of this species fall within the Kazan Upland and Dry Mixedwood natural subregions and within the Rocky Mountain Natural Region (see Figure 13B).

Global – This species is known from most Canadian provinces and territories (except Nova Scotia, Prince Edward Island and Newfoundland). It also occurs in Alaska, and seven of the northeastern states (as far south as Iowa). In addition to Alberta, it is considered rare in New Brunswick (S1), British Columbia (S1S3), Quebec (S1), Saskatchewan (S2S3), Michigan (S1), Vermont (SH) and Wisconsin (S1) (NatureServe 2003).

3. HABITAT:
FGWPP – The plant was growing between moss-covered rocks at the bottom of a rock outcrop, accompanied by scattered plants of *Woodsia ilvensis*, *Polypodium sibiricum*, *Cryptogramma acrostichoides* and *Carex deflexa*.

AB – At Wylie Lake, plants were found growing on a shaded cliff overhang by a lake (ANHIC 2003). In Whitemud Falls ER it was found in moist gullies between rock exposures in moss mats. Kershaw et al. (2001) suggested that it can be found in acidic to neutral rock crevices and on slopes in Alberta.

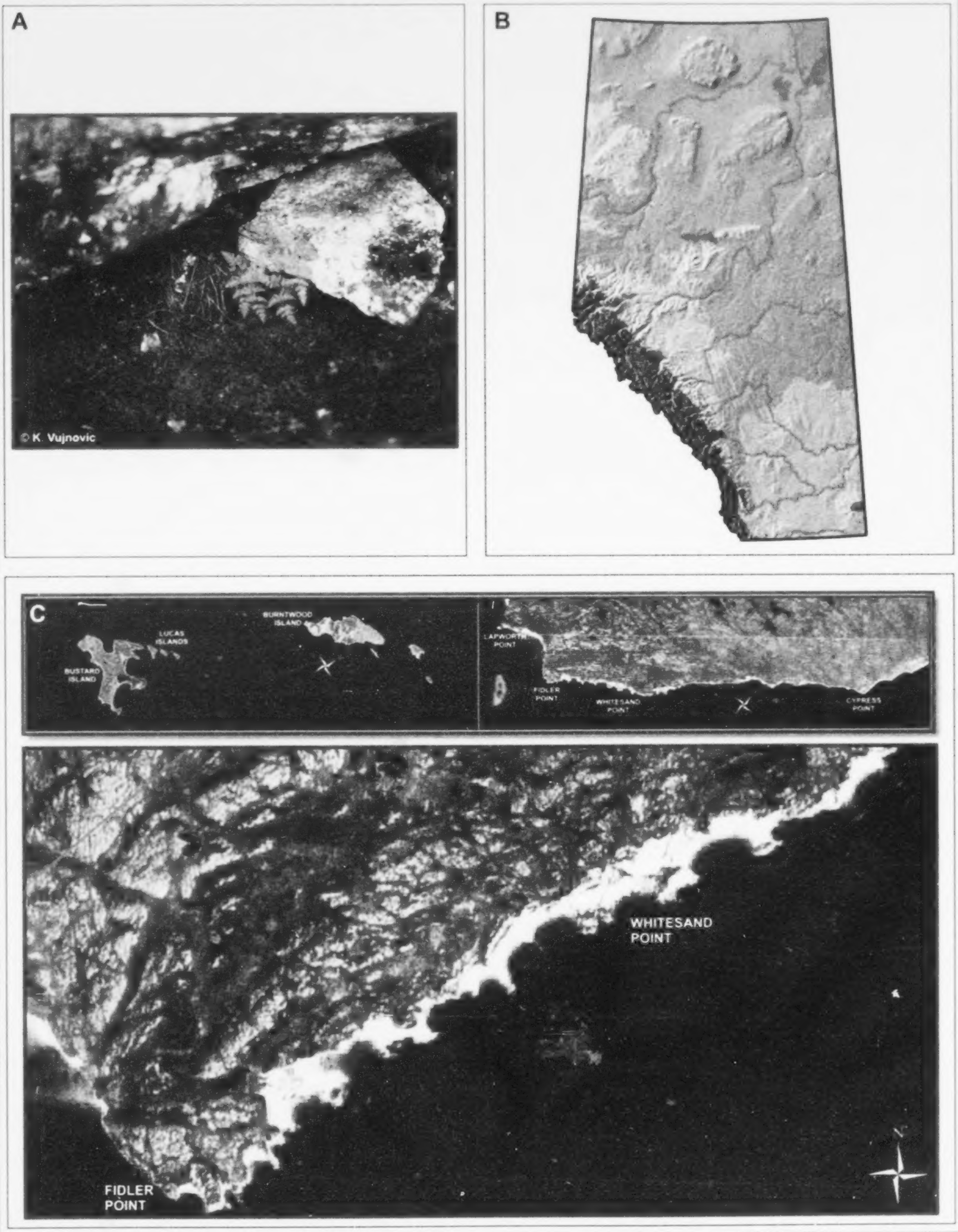
Elsewhere – Elsewhere it is known from cliffs and moist rocky woods, and moist cool shale or limestone slopes (Cody and Britton 1989, Douglas et al. 2000, Kershaw et. al. 2001). Flora of North America (FNA 1993) notes that this species inhabits granitic cliffs and outcrops as well as acid or neutral substrates at the summit of cool, shale talus slopes.

4. POPULATION SIZE:
FGWPP – Only one plant with half a dozen fronds was found.

AB – In Whitemud Falls ER it was described as rare. No information on population size is available for locations in the Rocky Mountains or at Wylie Lake.

5. PROTECTED AREAS: Fidler-Greywillow WPP; Whitemud Falls ER; Jasper NP.

Figure 13 *Gymnocarpium jessoense* (Koidzumi) Koidzumi (northern oak fern). **A** - image of the plant; **B** - known locations of *Gymnocarpium jessoense* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© K. Vujnovic
B
C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT

Huperzia (Lycopodium) selago (L.) Bernh. ex Mart. & Schrank (mountain club-moss)

S1 G5

1. BRIEF DESCRIPTION: *Huperzia selago* is a small perennial forb of the club-moss (Lycopodiaceae) family. It grows from short creeping stems with roots from among persistent leaves (Kershaw et al. 2001). In FGWPP this taxon exhibited a low, dense growth in patches, which made a count of individual plants impractical, thus the number and size of patches was noted to estimate the population size of this taxon within the study area.

2. DISTRIBUTION:

FGWPP – Cliff Wallis reported finding *Huperzia selago* at Fidler Point in 1984 (Fairbarns et al. 1984). During the 2001 survey, *Huperzia selago* was found in three general areas: near Fidler Point (four locations), Whitesand Point (two locations) and near an unnamed lake ca 3.2 km north of Fidler Point (one location)(see map 14C).

AB – An additional five locations within the province include those from Maybelle River WPP, Cameron Hills (the northernmost known location in Alberta, from a collection by M. Fairbarns in 1982), Fort MacKay area, Swan Hills and Muddy Creek (Wapiti River watershed). In Alberta, known locations of this species fall within the Central Mixedwood, Sub-Arctic, Upper Foothills, Kazan Upland and Athabasca Plain natural subregions (see Figure 14B).

Global – With the exception of British Columbia, this species seems to occur in all Canadian provinces and territories, and about fifteen (mostly northeastern) states. In addition to Alberta, it is considered rare in Manitoba (S2S3), New Brunswick (S1), Saskatchewan (S1), Connecticut (SH), Maine (S1), Massachusetts (S1), New York (SH), Vermont (S1), and Wisconsin (S1) (NatureServe 2003).

3. HABITAT:

FGWPP – It generally grew on rock outcrops, often in association with *Polypodium sibiricum*, *Dryopteris carthusiana*, *Poa glauca*, and *Carex umbellata*.

AB – Kershaw et al. (2001) reported that *Huperzia selago* grows in bogs and cold woods in northern Alberta. ANHIC (2003) lists aspen woods, marly pond edges and rock outcrops as habitats known to support this rare species. Woods, mossy rocks and barrens are listed as habitats for this species in Scoggan (1978-79).

Elsewhere – Kershaw et al. (2001) suggested that this is generally a species of moist tundra. According to Douglas et al (1998b), it grows in sandy borrow pits, lakeshore swales, ditches, and conifer swamps, and occasionally on acidic, igneous rock. Flora of North America (FNA 1993) notes that this species is found in ditches, lakeshore swales, sandy borrow pits, and coniferous swamps, occasionally growing on acidic, igneous rock and calcareous costal cliffs.

4. POPULATION SIZE:

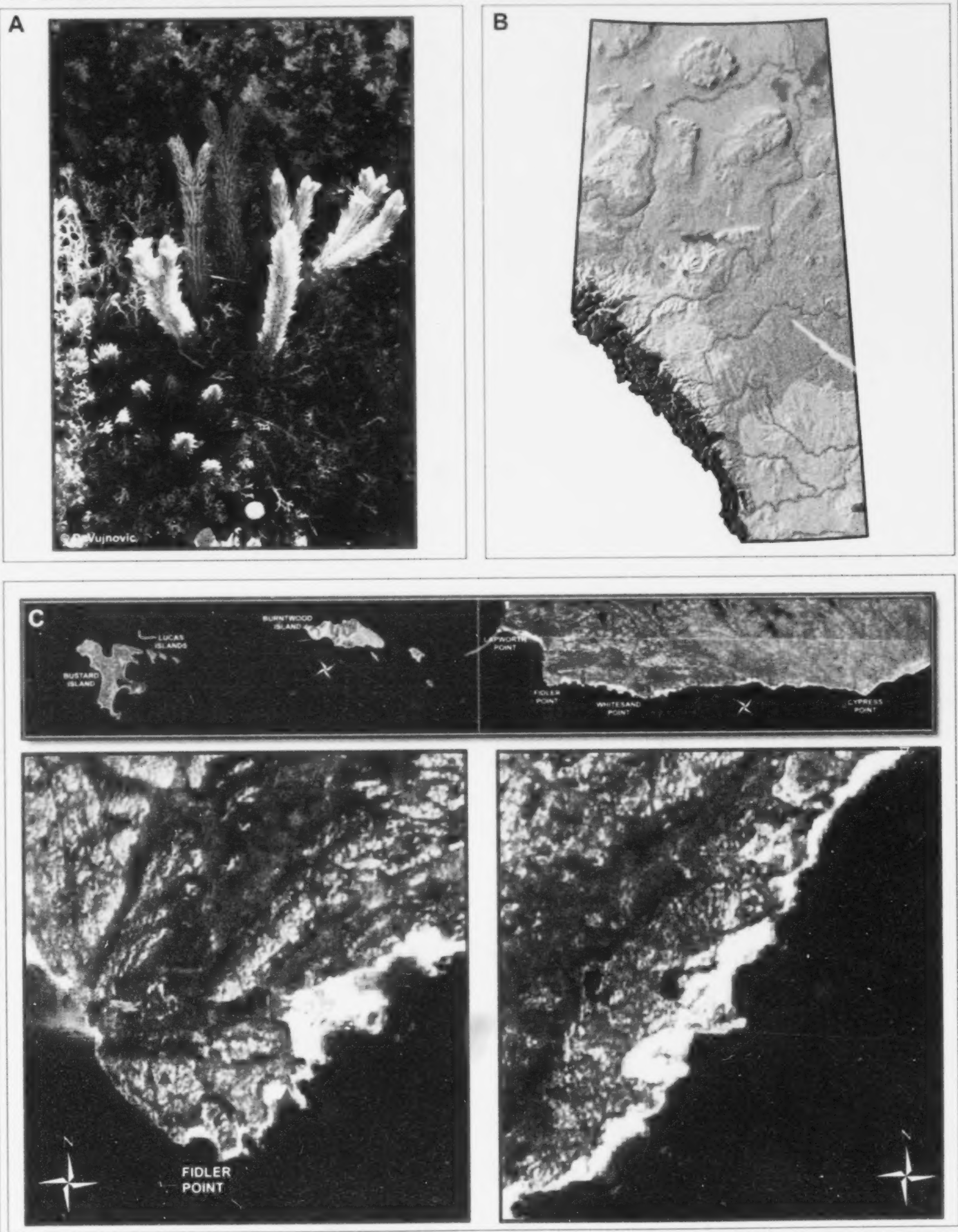
FGWPP – Altogether, about 40 patches were observed at locations within the study site. The biggest number of patches was counted in an area near Fidler Point.

AB – Fifty to 100 plants (patches) were estimated at the location(s?) in Maybelle River WPP. No information on population size is available for the remaining locations within the province, many of which are known from historic collections.

5. PROTECTED AREAS: Goose Mountain ER; Maybelle River and Fidler-Greywillow WPPs.

6. NOTES: Cliff Wallis reported finding *Lycopodium selago* at Fidler Point in 1984. At that time, it was believed that this species occurred both in the Rocky Mountains as well as in the northern parts of Alberta. All Alberta specimens of *L. selago* were subsequently annotated according to the Flora of North America (FNA 1993), which recognized the Rocky Mountain population as a new species, *Huperzia haleakalae*, and changed the name of the more northern species to *Huperzia selago*.

Figure 14 *Huperzia (Lycopodium) selago* (L.) Bernh.. ex Mart. & Schrank (mountain club-moss). **A** - image of the plant; **B** - known locations of *Huperzia (Lycopodium) selago* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© D. Vujnovic
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
FIDLER POINT
N

Hypericum majus (Gray) Britt. (large Canada St. John's-wort) S2 G5

1. BRIEF DESCRIPTION: *Hypericum majus* is an annual forb of the St. John's-wort (Clusiaceae [Hypericaceae]) family. It grows from spreading, horizontal underground stems (rhizomes) (Kershaw et al. 2001) (thus we counted number of "plants" to estimate population size for this species in FGWPP).

2. DISTRIBUTION:
FGWPP – *Hypericum majus* was reported from this study area for the first time in 1984 when Peter Lee found it at Fidler Point and on Bustard Island. Both sites were re-found during the 2001 study, and an additional seven were found along the north shore of Lake Athabasca and two on Burntwood Island (see map 15C).

AB – *Hypericum majus* is also known from Colin-Cornwall Lakes, Maybelle River, Richardson River Dunes and Marguerite River WPPs, and from the Athabasca Dunes ER (seven locations altogether). An additional six locations are known at Fort Hills, Round Hill, Lesser Slave Lake, Opal and White Rock Coulee (the southmost known location of this species in Alberta). Presently known locations in Alberta fall within the Central Mixedwood, Dry Mixedwood, Athabasca Plain, Kazan Upland and Dry Mixedgrass natural subregions (see Figure 15B).

Global – It is known from all Canadian provinces (but not from the territories) and from numerous states, found as far south as Washington, Oklahoma and Florida. In addition to Alberta, it is considered rare in British Columbia (S2S3), New Brunswick (S2), Nova Scotia (S1), Prince Edward Island (S1), Missouri (SH), New Jersey (S1), Oklahoma (S1), Pennsylvania (S2) and Washington (S1?) (NatureServe 2003).

3. HABITAT:
FGWPP – It generally grew in somewhat protected sandy bays where an area of wet sands with scattered cobbles forms a transition zone from rocky shoreline to sandy beaches. It was most often associated with *Sagina nodosa* and *Juncus alpinoarticulatus*, but other species were also noted, such as *Equisetum palustre*, *Epilobium ciliatum*, *Ranunculus gmelinii*, *Senecio congestus*, *Carex lenticularis* var. *lipocarpa*, *Carex viridula*, *Rorippa islandica*, *Ranunculus reptans*, *Primula mistassinica*, and provincially rare *Juncus brevicaudatus* and *Juncus filiformis*.

AB – In other locations within the Canadian Shield it inhabited various habitats, including a fairly dry *Picea mariana*/*Ledum groenlandicum*/*Sphagnum* community, an *Eriophorum*/*Sphagnum* community with *Chamaedaphne calyculata*, *Scheuchzeria palustris* and *Andromeda polifolia*, an open sandy lake shore, with *Carex viridula*, *Chamaedaphne calyculata*, *Drosera rotundifolia*, *Primula mistassinica* and *Viola* cf. *pallens*, and a dried-up beaver pond. Plants found outside the Canadian Shield were found mainly on sandy shores, dry lakebeds and along edges of sinkholes (ANHIC 2003).

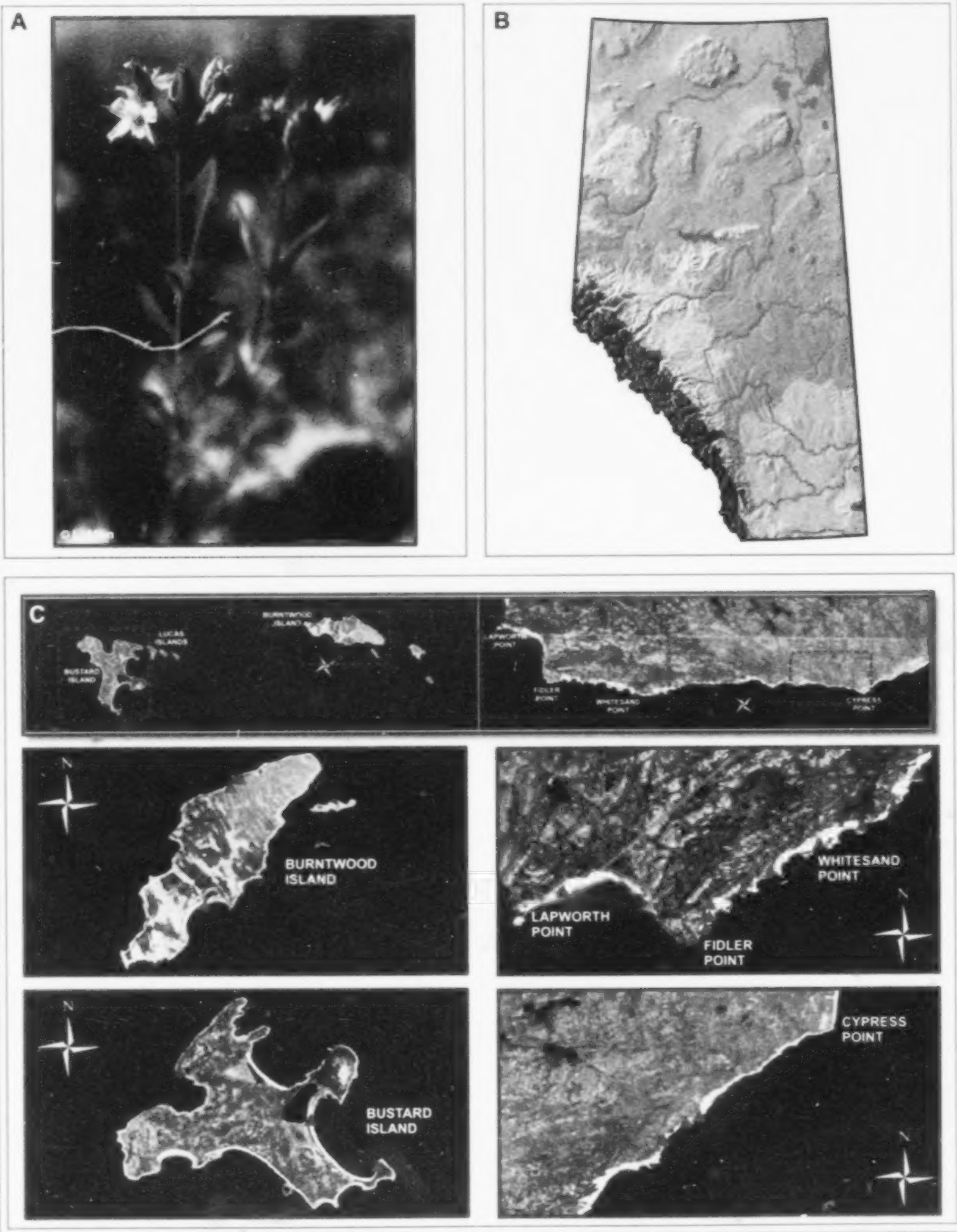
Elsewhere – In British Columbia, it grows in moist to wet places, vernal pools, gravelly shorelines and tidal shores in the lowland zone (Douglas et al. 1998b, Douglas et al. 2002). Scoggan (1978-79) just notes that *Hypericum majus* grows on moist grounds.

4. POPULATION SIZE:
FGWPP – Thousands of "plants" were estimated at the location just east of Fidler Point and at the easternmost location within the park. Other locations within the study site often contained 100s of "plants" each.

AB – Thousands of plants were estimated at the White Rock Coulee location (population subsequently disturbed) and hundreds of plants were reported from both Maybelle River WPP and Fort Hills (ANHIC 2003). Information on population size is not available for other locations within the province, some of which are known from historic collections.

5. PROTECTED AREAS: Colin-Cornwall Lakes, Maybelle River, Richardson River Dunes and Marguerite River WPPs; Athabasca Dunes ER; Opal NA.

Figure 15 *Hypericum majus* (Gray) Britt. (large Canada St. John's-wort). **A** - image of the plant; **B** - known locations of *Hypericum majus* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
B
C
LUCAS ISLANDS
BUSTARD ISLAND
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N
N
BUSTARD ISLAND
CYPRESS POINT
N

Isoetes echinospora Durieu (northern quillwort) S1 G5?

1. BRIEF DESCRIPTION: *Isoetes echinospora* is a submerged aquatic perennial of the quillwort (Isoetaceae) family. It grows from fibrous roots (Kershaw et al. 2001), thus each little bunch of leaves was considered an individual and number of plants was estimated to approximate population size within the study area.

2. DISTRIBUTION:
FGWPP – During the 2001 survey, it was found only once, in the larger of the two lakes on the eastern shore of Bustard Island (see map 16C).

AB – *Isoetes echinospora* was reported from north of Lake Athabasca for the first time in 1932 when H.M. Raup and E.C. Abbe collected a specimen from a small lake at Sand Point, some 17 km north of Bustard Island. This species is known from only five additional locations in the province: Andrew Lake and Colin-Cornwall Lakes WPP north of Lake Athabasca, Marguerite River WPP (Canadian Shield south of Lake Athabasca), Cameron Hills (the northernmost location) and Maqua Lake Provincial Recreation Area (Fort McMurray region, the southernmost location). Presently known locations in Alberta fall within the Central Mixedwood, Sub-Arctic, Boreal Highlands, Athabasca Plain and Kazan Upland natural subregions (see Figure 16B).

Global – *Isoetes echinospora* has been reported from all Canadian provinces and territories and numerous states, as far north as Alaska and as far south as California, Utah, Colorado, Minnesota, Ohio and Delaware. In addition to Alberta, it is considered rare only in Rhode Island (S1), Utah (S1) and Delaware (S1) (NatureServe 2003).

3. HABITAT:
FGWPP – Plants were growing on a sandy substrate in water up to 30 cm deep. The population of *Isoetes echinospora* at this location is considered a submergent aquatic community type (rare in Alberta, currently ranked S1 on the preliminary plant community tracking list)(Allen 2004), and is described in more detail in Allen et al. (2003b).

AB – Kershaw et al. (2001) described it as growing in permanent lakes and ponds, in clear, nutrient-poor, non-calcareous lakes and ponds, in shallow water up to about 1 m deep.

Elsewhere – It grows infrequently in lakes in British Columbia, from lowland to subalpine zones (Douglas et al. 2000). Scoggan (1978-79) also noted that it grows in shallow water and wet shores in Canada. According to the Flora of North America (FNA 1993), this species grows emergent or in shallow, cool, nutrient poor water of slightly acidic streams, ponds and lakes.

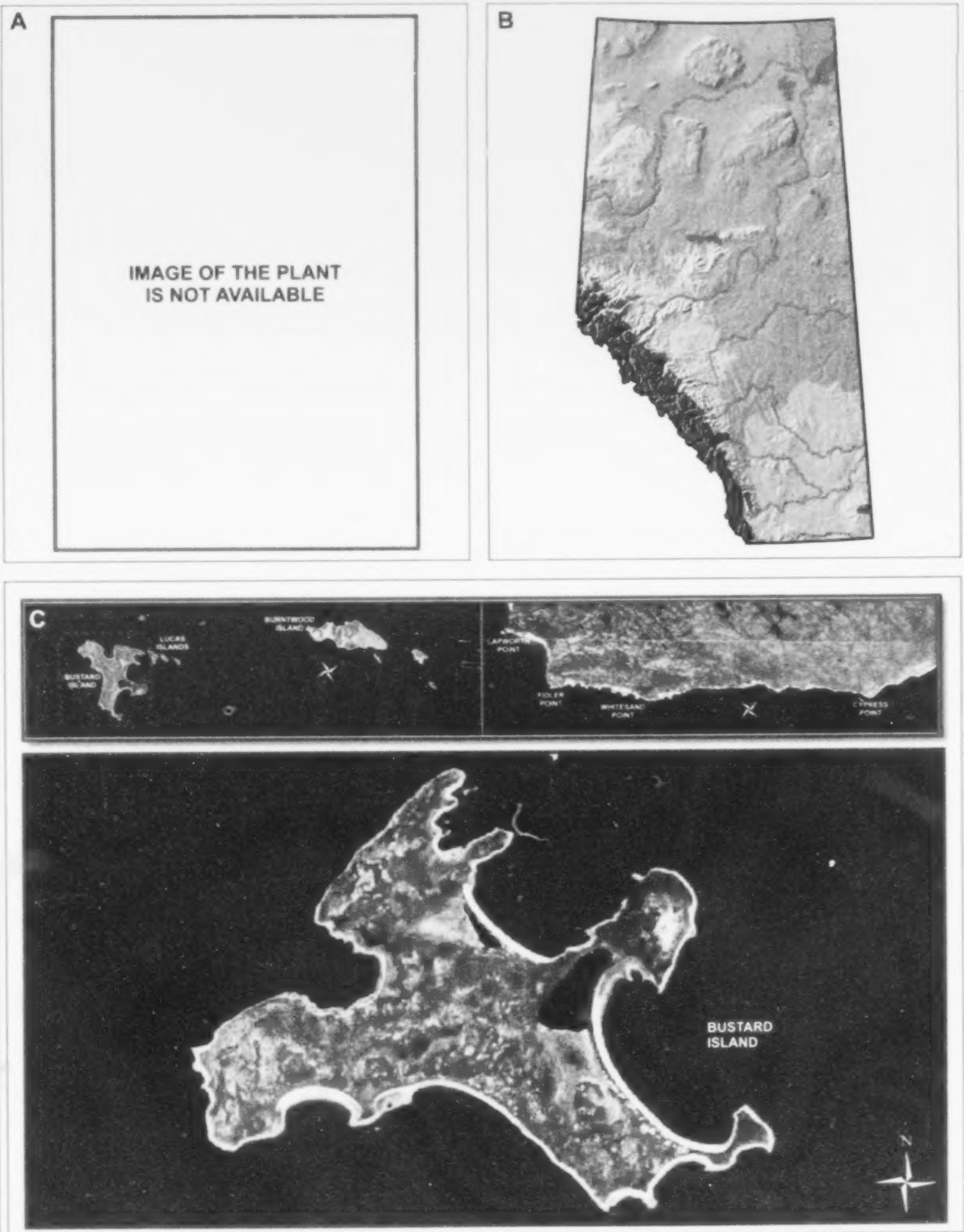
4. POPULATION SIZE:
FGWPP – More than 100 plants were noted along a 30 m stretch of shoreline, but it is estimated that thousands of plants likely grew around the entire lake.

AB – It was described as frequent in ponds and lakes in the Cameron Hills and about 140 plants were reported from Marguerite River. There could be 1000s of plants on the bottom of Colin Lake in Colin-Cornwall Lakes WPP, but it was hard to estimate because of the high similarity of *Isoetes echinospora* and co-occurring seedlings of *Sagittaria cuneata* (ANHIC 2003). Information on population size is not available for the remaining locations.

5. PROTECTED AREAS: Maqua Lake (PRA); Marguerite River, Colin-Cornwall Lakes and Fidler-Greywillow WPPs.

7. NOTES: There does not appear to be other suitable habitat within the park, therefore additional occurrences of this species within the park are not expected.

Figure 16 *Isoetes echinospora Durieu* (northern quillwort). **A** - image of the plant; **B** - known locations of *Isoetes echinospora* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
IMAGE OF THE PLANT
IS NOT AVAILABLE
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
BUSTARD ISLAND
N

Juncus brevicaudatus (Engelm.) Fern. (short-tail rush) S2 G5

1. BRIEF DESCRIPTION: *Juncus brevicaudatus* is a tufted perennial herb of the rush (Juncaceae) family. It grows from short rhizomes (Douglas et al. 2001a).

2. DISTRIBUTION:
FGWPP – Cliff Wallis reported finding *Juncus brevicaudatus* at Fidler Point in 1984 (Fairbarns et al. 1984). Seven of the specimens of *Juncus* spp. collected from the Fidler-Greywillow area during the 2001 reconnaissance survey were subsequently determined to be *Juncus brevicaudatus*. These were collected from six locations along the shoreline of the mainland and Burntwood Island (see Figure 17C).

AB – Prior to the 2001 survey, *Juncus brevicaudatus* was known from only two locations in the Canadian Shield north of Lake Athabasca: the Colin Lake area and Wylie Lake (both locations reported by C. Wallis in 1983). Five locations are found in and around the Athabasca Dunes ER, Maybelle River WPP and Marguerite River WPP. Six additional locations have been reported from Goodwin Lake, Opal, Virginia Hills and Lower Kananaskis Lake. Presently known locations of this species in Alberta fall within the Central Mixedwood, Dry Mixedwood, Sub-Alpine, Upper Foothills, Athabasca Plain and Kazan Upland natural subregions (see Figure 17B).

Global – *Juncus brevicaudatus* is known from all Canadian provinces (but not from the territories) and a number of states (but with a scattered distribution), reaching as far south as in Arizona, Colorado, Minnesota, Michigan and North Carolina. In addition to Alberta, this species is considered rare in Colorado (S1), Maryland (S2), New Jersey (S2), North Carolina (S1?), North Dakota (S2), Virginia (S2), and Wyoming (S2). Alberta represents the northwestern extent of its natural range in North America (NatureServe 2003).

3. HABITAT:
FGWPP – Plants were found on somewhat protected sandy shorelines, in distinct bands of vegetation on moist sands back from the main area of wave action. They also often grew between cobbles, in association with one or a number of the following species: *Juncus alpinoarticulatus*, *Carex lenticularis* var. *lipocarpa*, *Epilobium ciliatum*, *Senecio congestus*, *Carex aquatilis*, *Juncus bufonius*, *Carex viridula*, and some rare ones such as *Hypericum majus*, *Sagina nodosa* and *Juncus filiformis*.

AB – *Juncus brevicaudatus* also grows in dune slacks, on sandy lakeshores and around small ponds in and around Maybelle (Athabasca) dunes (Maybelle River WPP), and on a lakeshore in Marguerite River WPP. At Goodwin Lake, Opal, Virginia Hills and Lower Kananaskis Lake, it was generally reported as growing in moist disturbed areas (ANHIC 2003).

Elsewhere – This species grows in wet meadows, peat bogs, lakeshores and riverbanks in the lowland zone of British Columbia (but introduced to BC from eastern North America) (Douglas et al. 2001a). Scoggan (1978-79) suggested that it grows in muddy and wet places in Canada. Flora of North America (FNA 2000) describes the habitat of this species as generally acidic or peaty moist sites, including areas around hot springs and emergent shorelines.

4. POPULATION SIZE:
FGWPP – Since it was not recognized as a distinct species during the fieldwork, no estimation on the population size for this location is available.

AB – Information on population size is available for only one of the presently known locations of this species in the province. At the location near the town of Opal, two small patches were noted, each containing 50 to 100 individuals (ANHIC 2003).

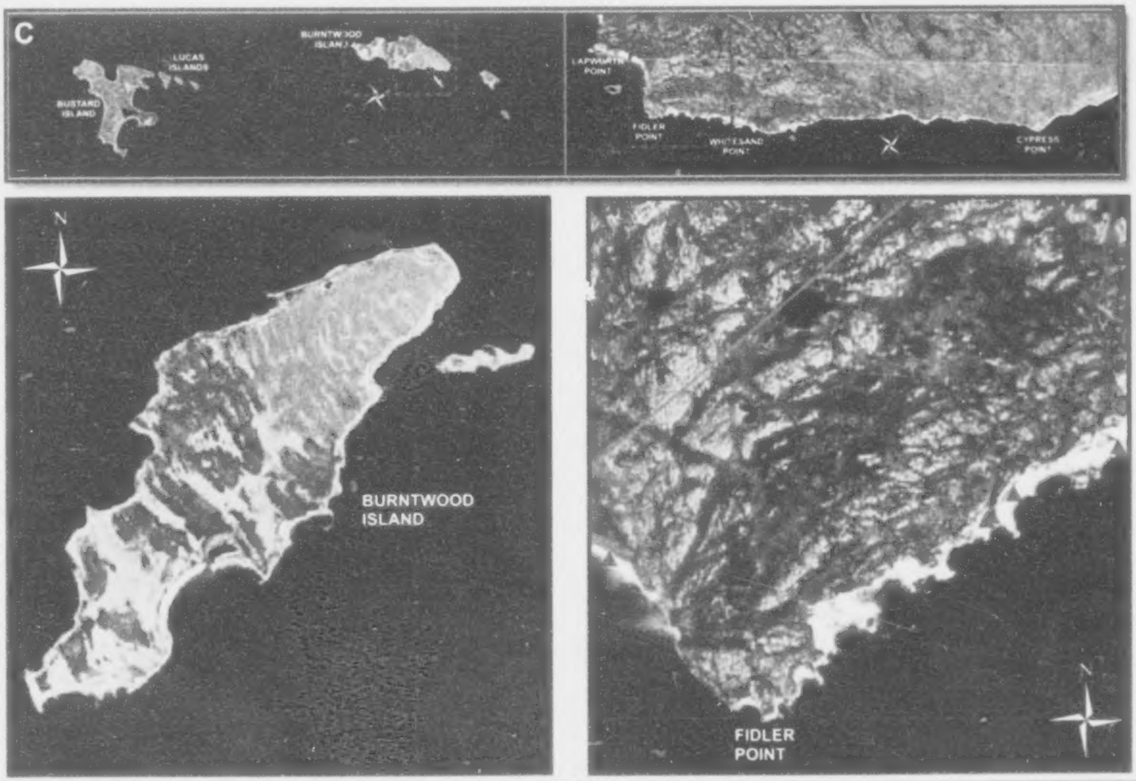
5. PROTECTED AREAS: Peter Lougheed PP, Colin-Cornwall Lakes, Maybelle River, and Marguerite River WPPs; Athabasca Dunes ER.

6. NOTES/RECOMMENDATIONS: Seven out of twelve collected specimens of *Juncus* spp. have been identified as *Juncus brevicaudatus*, and only five as the closely resembling species *Juncus alpinoarticulatus*. Both species were sometimes collected from the same location. It can be speculated that the population of this species along the shoreline of Fidler-Greywillow WPP (including islands) may be quite extensive, but this needs to be confirmed through additional surveys.

Figure 17 *Juncus brevicaudatus* (Engelm.) Fern. (short-tail rush). **A** - image of the plant; **B** - known locations of *Juncus brevicaudatus* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
FIDLER POINT
N

Juncus filiformis L. (thread rush) S2S3 G5

1. BRIEF DESCRIPTION: *Juncus filiformis* is a perennial herb of the rush (Juncaceae) family. It grows in rows or small clumps from slender, elongated underground stems (rhizomes) (Kershaw et al. 2001). Because of its morphological characteristics (thread-like appearance of stems, with reduced leaves) and the fact that they reproduce by rhizomes, the number of stems was counted/estimated to approximate population size within the study area.

2. DISTRIBUTION:
FGWPP – The first record of *Juncus filiformis* in this study area was by Peter Lee, who collected a couple of specimens near Fidler Point in 1984. During the 2001 survey, *Juncus filiformis* was found at this earlier location as well as in numerous additional locations along the shore of the mainland and Burntwood and Bustard islands (see Figure 18C).

AB – *Juncus filiformis* also occurs in Colin-Cornwall Lakes (Collection by C. Wallis in 1983) and La Butte Creek WPPs (three locations altogether, collected in 2001). An additional three northern locations include the Moose Lake area in Wood Buffalo National Park (H.M. Raup's collection from 1929) and Caribou Mountains WPP. It has also been reported from 22 other locations in northwestern Alberta, the Fort McMurray region, an area south of Lesser Slave Lake and in the Rocky Mountain House area. Presently known locations of this species in Alberta fall within the Athabasca Plains, Kazan Upland, Central Mixedwood, Wetland Mixedwood, Sub-Arctic, Upper Foothills and Lower Foothills natural subregions (see Figure 18B).

Global – It is known from all Canadian provinces and territories and numerous states, reaching as far north as Alaska and as far south as Oregon, Utah, New Mexico, Minnesota, Michigan and West Virginia. Other than Alberta, it is considered rare at the southern limits of its range: in Colorado (S2?), Massachusetts (S1), Utah (S2S3), West Virginia (S2), and Wyoming (S1) (NatureServe 2003).

3. HABITAT:
FGWPP – It was often associated with wet sand with scattered cobbles found near the mouth of small creeks where they cut between dune ridges and drain into Lake Athabasca, or it grew on somewhat protected sandy bays in wetter areas back from the shoreline or near the forest edge. Associated species often included *Juncus alpinoarticulatus*, *Carex lenticularis* var. *lipocarpa*, *Carex saxatilis*, *Rorippa palustris*, *Ranunculus reptans*, *Equisetum palustre*, *Senecio congestus*, *Epilobium ciliatum*, *Ranunculus gmelinii*, *Primula mistassinica*, and some of the rare ones such as *Sagina nodosa*, *Juncus brevicaudatus* and *Hypericum majus*.

AB – Kershaw et al. (2001) suggested that this species grows in fens and marshes in Alberta. It also grows among emergent vegetation on river and lakeshores, on gravelly roadsides, on cutlines through mesic forests, and in sinkholes and small wooded pools (ANHIC 2003).

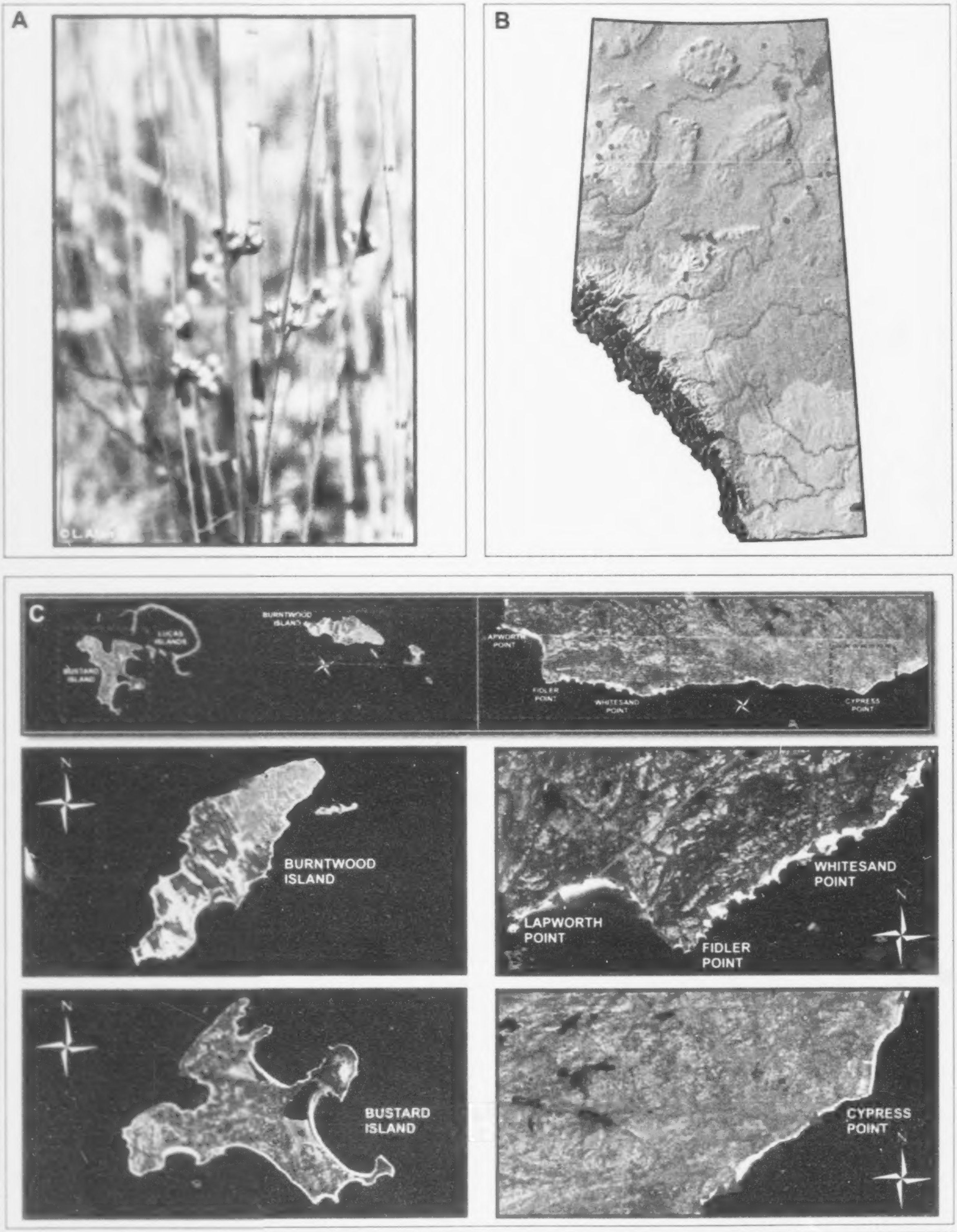
Elsewhere – Kershaw et al. (2001) noted that outside Alberta *Juncus filiformis* grows on lakeshores and stream-banks. It grows in moist meadows and wet sandy lakeshores from the lowland and steppe to subalpine zones in British Columbia (Douglas et al. 2001a). Swampy ground, bogs and shores are listed as habitats for *Juncus filiformis* in Scoggan (1978-79). According to the Flora of North America (FNA 2000), this species usually grows on moist to wet, sandy soil along lakes, pools, stream banks, or in meadow depressions; occasionally it is found in bogs.

4. POPULATION SIZE:
FGWPP - A few thousand stems were estimated in the locations visited. More are expected to grow in appropriate habitats along the shore of Lake Athabasca within the park.

AB – Information on population size is available for only nine known locations, where population sizes range from "very scarce" at Clear Hills and " three tussocks" at Baseline Lake, to "1000s of stems" on the Caribou Mountains, or even "10 000 plants" at one Grizzly Ridge location.

5. PROTECTED AREAS: Colin-Cornwall Lakes, La Butte Creek, Caribou Mountains, Fidler-Greywillow and Grizzly Ridge WPPs; Wood Buffalo NP; Crow Lake PP.

Figure 18 *Juncus filiformis* L. (thread rush). **A** - image of the plant; **B** - known locations of *Juncus filiformis* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N
BUSTARD ISLAND
CYPRESS POINT

Juncus stygius L. ssp. *americanus* (Buch.) Hult. (marsh rush) S2 G5T5

1. BRIEF DESCRIPTION: *Juncus stygius* ssp. *americanus* is a perennial herb of the rush (Juncaceae) family. It grows single or in small tufts resulting from growth from slender underground stems (rhizomes) (Kershaw et al. 2001). The reproduction from rhizomes made it difficult to estimate the number of individuals on sites, so the number of "plants" was estimated to approximate population size within the study area.

2. DISTRIBUTION:
FGWPP – It has not been reported from the Canadian Shield NR prior to the 2001 survey of Fidler-Greywillow WPP, when it was found in two separate locations: one on Burntwood Island and the other on the mainland, in an area between Fidler and Whitesand points (see Figure 19C).

AB – An additional nine locations of this species in Alberta are found on the Caribou Mountains and in an area just south of them, Stoney Mountain (Fort McMurray area), Swan Hills and in the foothills of western Alberta. Known locations within the province fall within the Dry Mixedwood, Boreal Highlands, Upper Foothills, Lower Foothills and Athabasca Plain natural subregions (see Figure 19B).

Global – *Juncus stygius* ssp. *americanus* is known from all Canadian provinces and territories, and from seven, mostly northeasterly states. It is found as far north as Alaska and as far south as Minnesota, Wyoming, Michigan and New York. In addition to Alberta, it is considered rare or historical in Manitoba (S1?), New Brunswick (S1), Nova Scotia (S1), Saskatchewan (S1S2), Maine (S2), New Hampshire (S1) and New York (SH). It is also listed as rare in the Northwest Territories (McJannet et al. 1995) and Yukon territory (Douglas et al. 1981).

3. HABITAT:
FGWPP – On Burntwood Island, it grew in a floating fen, associated with *Carex lasiocarpa*, *Carex rostrata*, *Equisetum fluviatile*, *Menyanthes trifoliata*, *Drosera rotundifolia* and *Drosera anglica*. On the mainland it was found in a *Carex limosa – Scheuchzeria palustris/Sphagnum angustifolium* poor fen, located in a distinct depression behind a sand ridge not far from the lakeshore (see Allen et al. 2003b for details on this community type).

AB – Kershaw et al. (2001) noted that it grows in fens in Alberta.

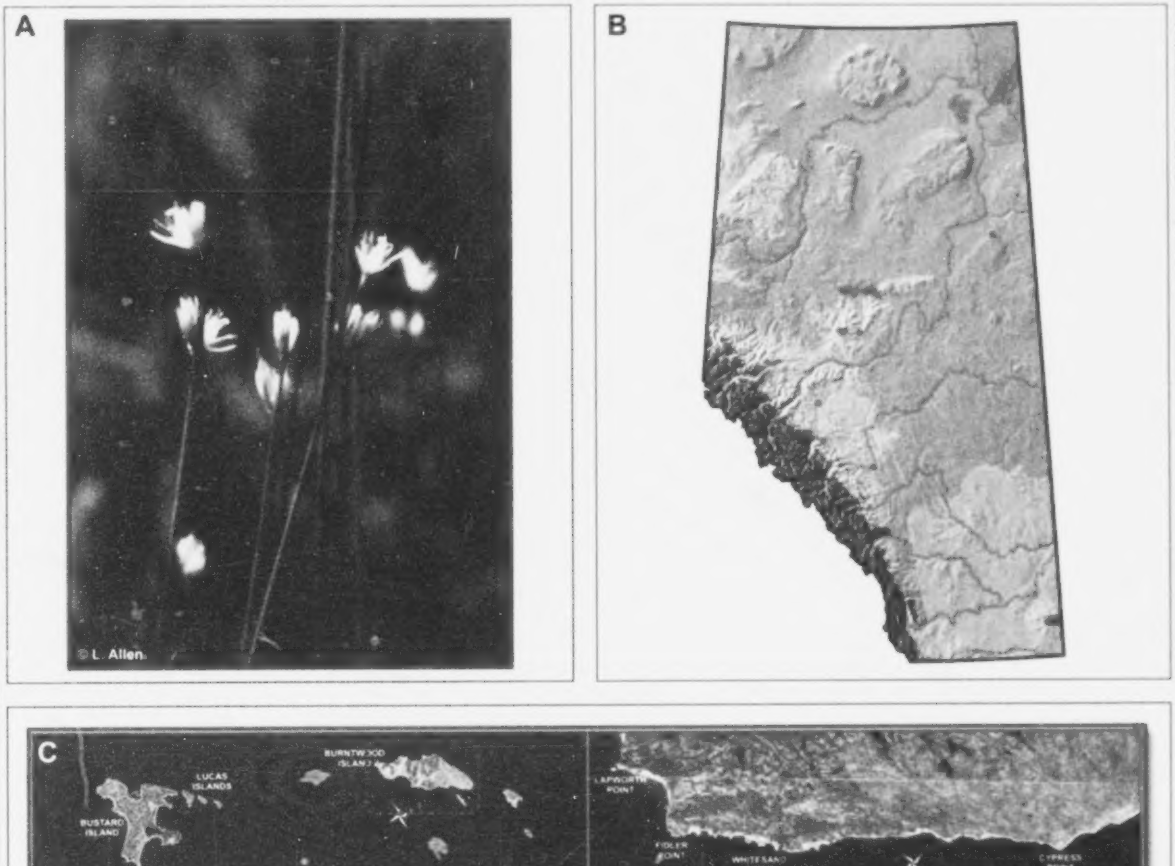
Elsewhere – Outside Alberta it can be found in mossy areas around spring seepages (Kershaw et al. 2001). Scoggan (1978-79) noted that it grows in wet moss, bogs and bog-pools. It is found on pond margins and peat bogs in the lowland and montane zones of British Columbia (Douglas et al. 2001a). According to the Flora of North America (FNA 2000), this species grows in bogs, bog pools and wet moss.

4. POPULATION SIZE:
FGWPP – This species grew more abundantly in the Burntwood Island location (more than 1000 "plants" estimated) compared to the mainland location (a few 100s of "plants" at the most).

AB – A couple of hundred plants were estimated in the Caribou Mountains location (ANHIC 2003). Information on population size is not available for the remaining locations within the province, most of which are known from historic records.

5. PROTECTED AREAS: Maqua Lake PRA; Caribou Mountains and Fidler-Greywillow WPPs.

Figure 19 *Juncus stygius* L. ssp. *americanus* (Buch.) Hult. (marsh rush). **A** - image of the plant; **B** - known locations of *Juncus stygius* ssp. *americanus* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen.
B
C
BUSTARD ISLAND
LUCAS ISLANDS
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
N

Leymus (*Elymus*) *mollis* (Trin.) Hara (American dune grass) S1 G5

1. BRIEF DESCRIPTION: *Leymus mollis* is a tall perennial herb of the grass (Poaceae [Gramineae]) family. This mat-forming plant grows from long, thick underground stems (rhizomes) (Kershaw et al. 2001). Because this species spreads by rhizome, but appears as individual plants aboveground, the number of "plants" was counted/estimated to approximate population size within the study site.

2. DISTRIBUTION:
FGWPP – Peter Lee reported finding this species at Fidler Point in 1984. During the biophysical survey in 2001, *Leymus mollis* was found growing abundantly in many places along the shoreline of the mainland (including Fidler Point) as well as on Bustard Island (see Figure 20C).

AB – It has been known to grow along the north shore of Lake Athabasca in Alberta since 1932, when H.M. Raup and E.C. Abbe collected specimens at Sand Point and Shelter Point, situated approximately 24 km and 38 km west of the study site, respectively (see Figure 20B).

Global – *Leymus mollis* is mainly a northern species; know from all Canadian provinces and territories, and from a few states, namely Alaska, California, Illinois, Maine, Massachusetts, Michigan, New Hampshire, Oregon, Pennsylvania, Washington and Wisconsin. In addition to Alberta, it is considered rare in Manitoba (S2?), Saskatchewan (S2), Illinois (S1) and Massachusetts (S1) (NatureServe 2003).

3. HABITAT:
FGWPP – It mainly grew as a co-dominant species in a *Leymus (Elymus) mollis–Tanacetum bipinnatum* ssp. *huronense* sand dune community, but was occasionally found as isolated patches in the same type of habitat usually occupied by the community. The *Leymus (Elymus) mollis – Tanacetum bipinnatum* ssp. *huronense* community was generally found on slightly exposed lake beaches, on low, stabilizing, discontinuous dunes that are situated above the active wave zone and behind an area of unvegetated, dry blowing sand. Other frequent species included *Stellaria longipes*, *Artemisia campestris*, *Festuca rubra* and *Bromus inermis* var. *pumpellianus*. More details on this community type can be found in Allen et al. (2003b

AB – Kershaw et al. (2001) noted that it grows on sand dunes in Alberta.

Elsewhere – Outside Alberta, it is primarily known from coastal sand dunes (Kershaw et al. 2001). *Leymus mollis* grows on moist to mesic sandy or gravelly beaches and shoreline forests in the lowland zone of British Columbia (Douglas et al. 2001b) (beaches and sands are noted in Scoggan 1978-79).

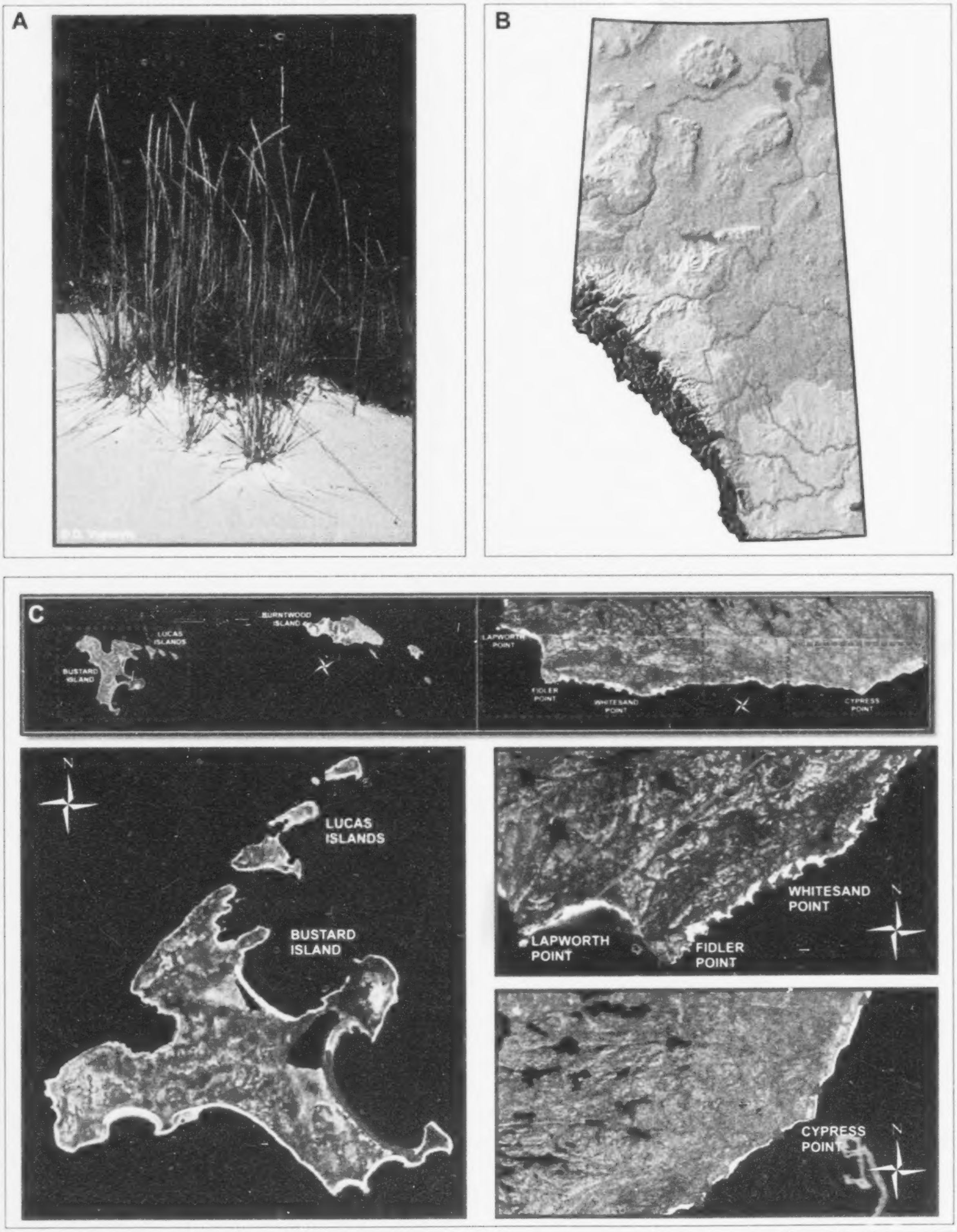
4. POPULATION SIZE:
FGWPP – A fairly extensive population ranging from a few "plants" to 100s of "plants" at numerous locations along the shoreline of the mainland and on Bustard Island.

AB – Information on population size is not available for the two known locations outside the study area, which are known from historic records.

5. PROTECTED AREAS: Fidler-Greywillow WPP.

6. NOTES/RECOMMENDATIONS: Although all Alberta records are from the north shore of Lake Athabasca, it likely also occurs in suitable habitat on the south shore, as it has been reported there on the Saskatchewan portion of the lake (Allen et al. 2003b).

Figure 20 *Leymus (Elymus) mollis* (Trin.) Hara (American dune grass). **A** - image of the plant; **B** - known locations of *Leymus (Elymus) mollis* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
LUCAS ISLANDS
BUSTARD ISLAND
WHITESAND POINT
N
LAPWORTH POINT
FIDLER POINT
CYPRESS POINT
N

Luzula groenlandica Bocher (wood-rush) S1 G4

1. BRIEF DESCRIPTION: *Luzula groenlandica* is a densely tufted perennial of the rush (Juncaceae) family. It grows from fibrous roots (Kershaw et al. 2001), thus individual plants were counted to estimate the population size in FGWPP).

2. DISTRIBUTION:
FGWPP – Peter Lee collected a specimen of *Luzula groenlandica* at Fidler Point in 1984. During the 2001 study, only one location of this species was found (see Figure 21C), possibly in the place of the original collection (no detailed location information was provided with the 1984 specimen).

AB – The location at Fidler-Greywillow WPP is in the transition zone between the Athabasca Plain and Kazan Upland natural subregions. This is the only known location of *Luzula groenlandica* within the province (see Figure 21B).

Global – This species is known from most Canadian provinces and territories, except Saskatchewan and the Maritimes (it is common in Labrador). It is not known from the United States, other than in Alaska (NatureServe 2003). In addition to Alberta, it is considered rare in British Columbia (S2S3) (BCCDC 2003), Manitoba (S1) and Quebec (S2S3)(NatureServe 2003).

3. HABITAT:
FGWPP – Peter Lee described the habitat as "moist crevices on rocky shore". In 2001, this species was found growing in coarse sand, between some of the big cobbles on one of the rocky beaches.

AB – Although Kershaw et al. (2001) suggest it grows in moist, turfy tundra in Alberta, the only documented occurrence is the one described above.

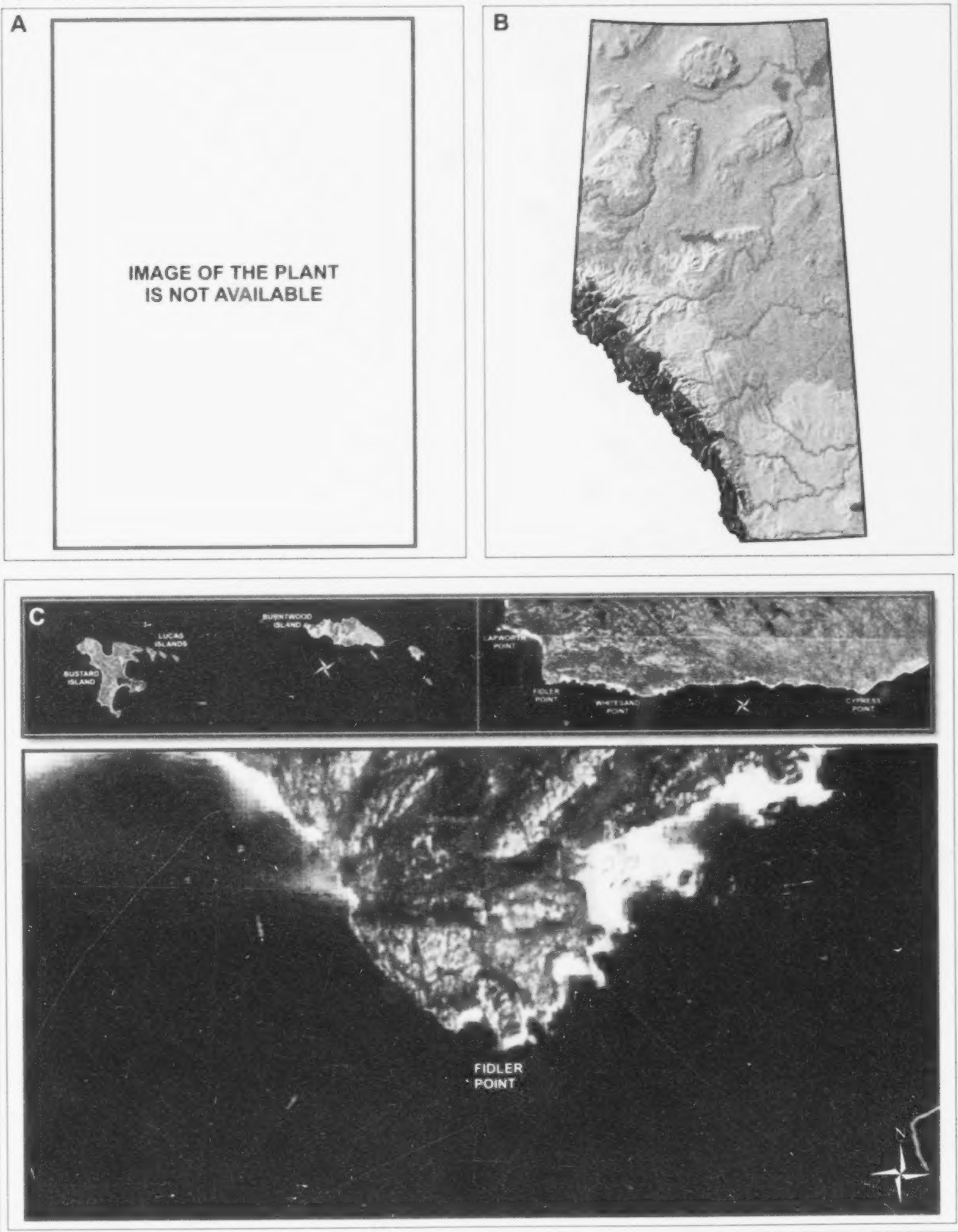
Elsewhere – It occupies wet depressions and snowbed sites in the alpine zone of British Columbia (Douglas et al. 2002). Scoggan (1978-79) suggested that it grew in moist or wet tundra and sandy acidic soils in Canada. According to the Flora of North America (FNA 2000), this species grows on sandy seashores among herbaceous vegetation, turfy tundra (often by water) and alpine flats.

4. POPULATION SIZE:
FGWPP – Described as very rare in 1984. Only a few plants were found in 2001 as well.

AB – A very small population in the province based on the information from the only known location.

5. PROTECTED AREAS: Fidler-Greywillow WPP.

Figure 21 *Luzula groenlandica* Bocher (wood-rush). **A** - image of the plant; **B** - known locations of *Luzula groenlandica* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
IMAGE OF THE PLANT IS NOT AVAILABLE
B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
FIDLER POINT
N

Lycopodiella inundata (L.) Holub (bog club-moss) S1 G5

1. BRIEF DESCRIPTION: *Lycopodiella inundata (Lycopodium inundatum* in Moss 1983) is a dwarf perennial herb of the club-moss (Lycopodiaceae) family. It grows from short, prostrate creeping stems (Kershaw et al. 2001), thus the number of "plants" was counted/estimated to approximate population size within the study site.

2. DISTRIBUTION:
FGWPP – *Lycopodiella inundata* was not verified from the Canadian Shield north of Lake Athabasca prior to this study. Cliff Wallis reported finding it at Fidler Point in 1984 (Fairbarns et al. 1984), but he was unsure of the identification, and the lack of a voucher specimen prevents verification of the name. This species was found at six locations along the shoreline of the mainland in 2001 (see Figure 22C).

AB – Known from only three additional locations in the province, all situated in Maybelle River WPP, south of Lake Athabasca (Athabasca Plain Natural Subregion) (see Figure 22B).

Global – Known from all Canadian provinces (but not from the territories). It's range extends as far north as Alaska and as far south as California, Idaho, Montana, Kentucky and North Carolina. In addition to Alberta, it is considered rare in numerous other jurisdictions in North America: Labrador (S2S3), Manitoba (S1), Saskatchewan (S1); California (S1?), Idaho (S2), Illinois (S1), Indiana (S1), Iowa (S1), Kentucky (S1S2), Maryland (S2), Montana (S1), New Jersey (S2), North Carolina (S1), Oregon (S2), Virginia (S1) and Washington (S2) (NatureServe 2003). This species is described as circumpolar but widely disjunct, known from Europe and Japan in addition to North America (Douglas et al. 2000).

3. HABITAT:
FGWPP – Found in somewhat protected sandy bays, back from the shoreline and near the forest edge, often right by *Myrica gale* thickets, on ground covered with *Pohlia* and *Bryum* species. Other commonly associated species include *Drosera anglica* and *Drosera rotundifolia*, *Spiranthes romanzoffiana*, *Primula mistassinica* and *Juncus vaseyi*.

AB – Elsewhere in Alberta it was associated with parabolic sand dune systems, in depressions between active dunes, in an open, wet *Salix planifolia* thicket near a creek and in a lake-edge fen with species such as *Carex aquatilis*, *Huperzia selago*, *Primula mistassinica*, *Hypericum majus*, *Scirpus hudsonianus* and *Carex viridula* (ANHIC 2003). Kershaw et al. (2001) note that this species grows in sphagnum bogs in Alberta.

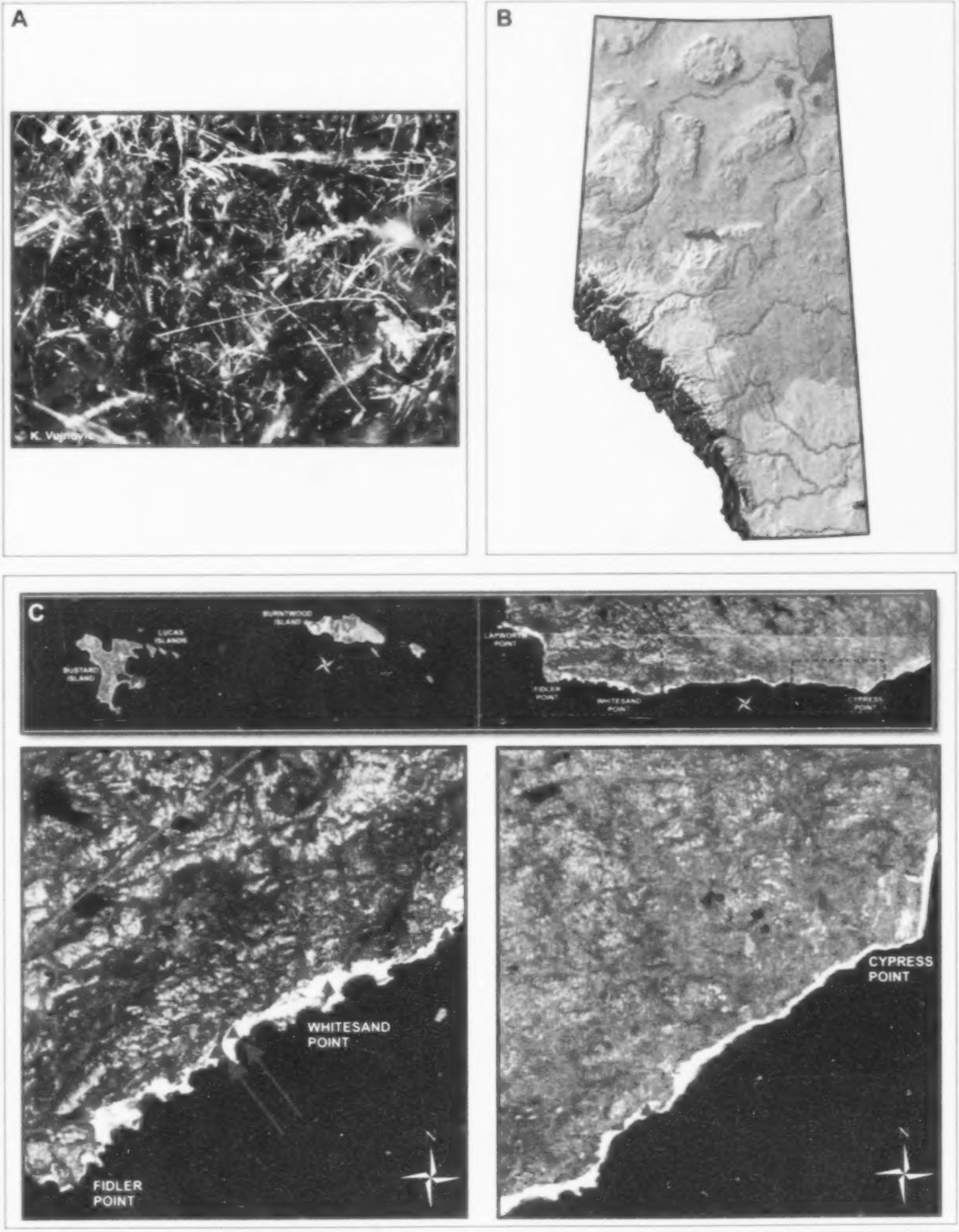
Elsewhere – Found on sandy shores and in marshes and other wet sites (Kershaw et al. 2001). Growing in bogs, pools in peatlands, and lake margins in the lowland and montane zones in British Columbia (Douglas et al. 2000). Scoggan (1978-79) notes that it grows on damp shores, in swamps and in bogs. According to the Flora of North America (FNA 1993), this species inhabits lakeshores, lichen dominated areas, borrow pits, marshes and bogs.

4. POPULATION SIZE:
FGWPP – Two of the six locations found during this study (marked with an arrow on Figure 22C) contain roughly up to a 1000 "plants". Few "plants" were discovered in other locations (up to 100 altogether).

AB – No population information is available for the locations in Maybelle River WPP and Athabasca Dunes ER.

5. PROTECTED AREAS: Maybelle River and Fidler-Greywillow WPPs; Athabasca Dunes ER.

Figure 22 *Lycopodiella inundata* (L.) Holub (bog club-moss). **A** - image of the plant; **B** - known locations of *Lycopodiella inundata* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© K. Vujnovic
B
C
BUSTARD ISLAND
LUCAS ISLANDS
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT
N
CYPRESS POINT
N

Polypodium sibiricum Sipl. (Siberian polypody) S2S3 G5?

1. BRIEF DESCRIPTION: *Polypodium sibiricum* is an evergreen herb of the polypody family (Polypodiaceae). It grows from thick creeping underground stems (rhizomes) (Kershaw et al. 2001). In FGWPP it exhibited a low, dense growth in patches, which made a count of individual plants impractical, thus the number and size of patches was noted to estimate the population size of this taxon within the study area.

2. DISTRIBUTION:
FGWPP – *Polypodium sibiricum* was reported from the study area for the first time in 1984 by Peter Lee, who collected a specimen near Fidler Point. The 2001 study confirmed the previously known location and resulted in finding 13 additional locations of this species along the shore of the mainland, from just outside the park's western boundary to about midway between Whitesand and Cypress points (see Figure 23C). Based on the amount of unexplored suitable habitat, it is highly probable that there are numerous other locations occupied by this species within the study area.

AB – This species was first documented as occurring on the north shore of Lake Athabasca in 1930 when an early explorer, Revell, collected a specimen near Fort Chipewyan. The species was found again in the same general area in 1950, 1969 and 2001. Most other known locations of *Polypodium sibiricum* in our province are clustered in two general areas, north of Lake Athabasca and in an outlier of the Canadian Shield known as the Marguerite River Crag and Tail south of Lake Athabasca, about 130 km north of Fort McMurray (this is within the Marguerite River WPP). The sites north of Lake Athabasca include La Butte Creek and Colin-Cornwall Lakes WPPs and the Andrew Lake and Wylie Lake areas. The westernmost location of *Polypodium sibiricum* is found west of Sergeant Creek in northwestern Alberta (a disjunct location), and a location at Whitemud Falls represents the southernmost known location of this species in the province. In Alberta, locations of *Polypodium sibiricum* fall into the Kazan Upland, Athabasca Plain and Central Mixedwood natural subregions (see Figure 23B).

Global – According to NatureServe (2003), this species is restricted to Canadian provinces and territories and to Alaska in North America (but it is not known from maritime provinces in Canada). It is considered historic (SH) in British Columbia and Ontario (NatureServe 2003).

3. HABITAT:
FGWPP – Within the study area *Polypodium sibiricum* was found on rock outcrops along the shoreline or on rock in open jack pine stands away from the shore. Commonly associated species included *Woodsia ilvensis*, *Festuca saximontana*, *Carex deflexa*, *Cryptogramma acrostichoides*, *Poa glauca*, *Potentilla tridentata*, *Agrostis scabra* and *Campanula rotundifolia*, as well as some provincially rare species such as *Huperzia selago*, *Potentilla multifida* and *Carex umbellata*.

AB – This species is known from moist cliffs and rocky sites in northern Alberta, growing on a variety of rocky substrates, including granite and limestone (Kershaw et al. 2001). At one location, habitat was described only generally as a moss meadow (ANHIC 2003).

Elsewhere – It grows on dry to moist rocks in the montane zone of BC (Douglas et al. 2002). According to the Flora of North America (FNA 1993), this species grows on a variety of substrates, including granite and dolomite, and is found in cracks and ledges on rock outcrops.

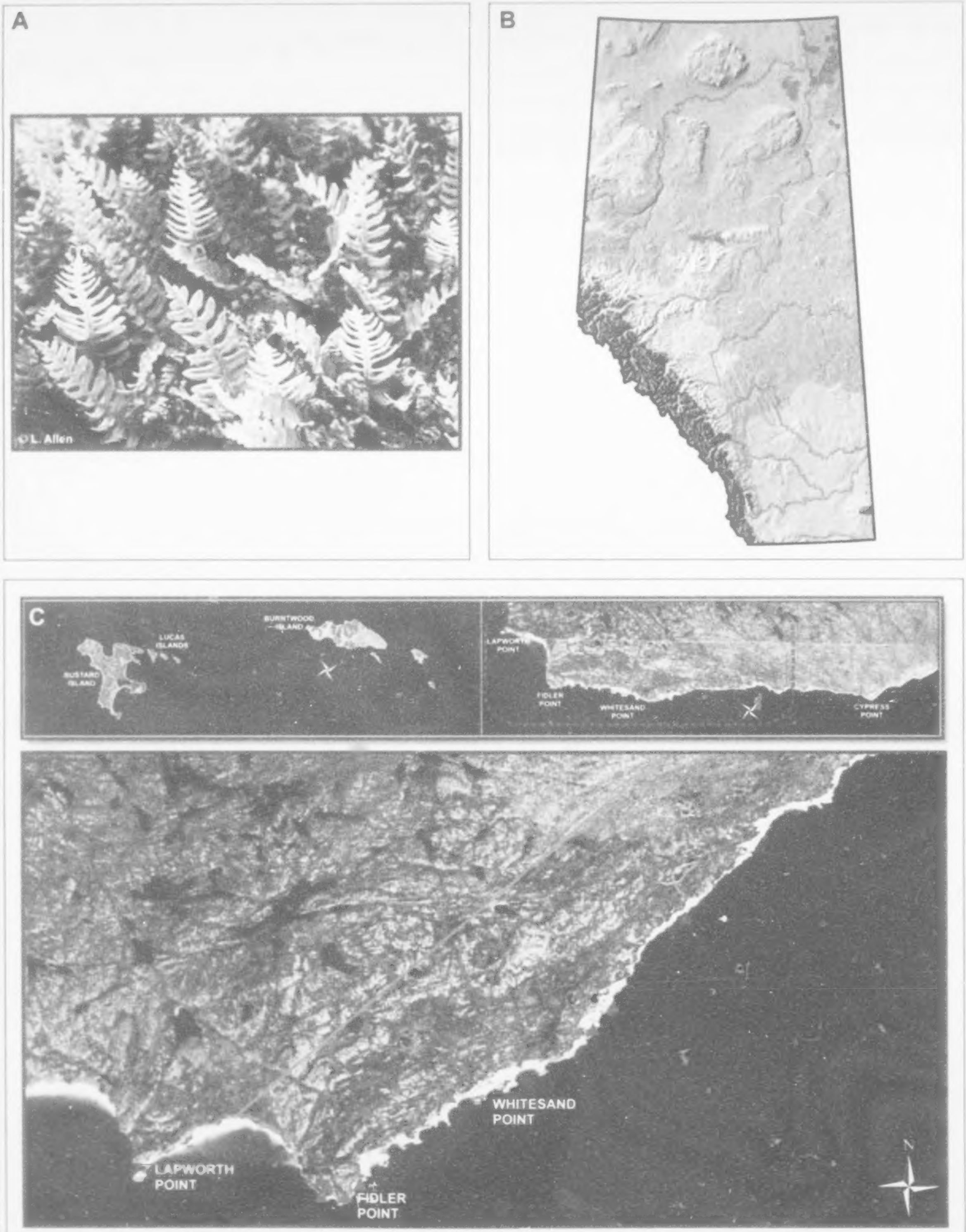
4. POPULATION:
FGWPP – A number of scattered patches were observed at each of the locations found during the 2001 survey, with more than 100 patches estimated in total. Patches ranged from 0.04 to 0.16 m^2 in size. Because of the amount of unexplored suitable habitat within the study area, the overall population of *Polypodium sibiricum* within FGWPP is expected to be much higher than shown.

AB – Approximately 50 patches of *Polypodium sibiricum* were observed at both Colin-Cornwall Lakes and La Butte Creek WPPs, but again, overall populations are expected to be much higher for the same reasons as discussed above. One of the two known locations within Marguerite River WPP contained 100s of plants. About two-dozen plants were counted at a location north of Fort McMurray (ANHIC 2003). Information on the approximate population size from the remaining locations is not available.

5. PROTECTED AREAS: Whitemud Falls ER; Marguerite River, Colin -Cornwall lakes, La Butte Creek and Fidler-Greywillow WPPs; Wood Buffalo NP.

6. NOTES: Specimens of *Polypodium sibiricum* used to be identified as *Polypodium. virginianum* until recent research indicated that they belong to the same species as the Eurasian *Polypodium sibiricum* (FNA 1993). *Polypodium sibiricum* is now considered a separate species that is distinguished from the closely related *Polypodium virginianum* by its smaller spores (less than 52 µm) (FNA 1993). The Flora of North America (FNA 1993) also suggests that *Polypodium sibiricum* and *Polypodium virginianum* hybridize where these species overlap in Canada (this includes northeastern Alberta). All specimens of *Polypodium* spp. from northeast Alberta were annotated by Dr. D. M. Britton in 2002. He identified most of them as *Polypodium sibiricum*, but noted that some specimens exhibit intermittent characteristics with *Polypodium virginianum*, therefore suggesting possible hybrids of these two species (Britton, D.M., personal comm.). According to Dr. Britton, a good *Polypodium virginianum* specimen has not yet been found in Alberta.

Figure 23 *Polypodium sibiricum* Sipl. (Siberian polypody). **A** - image of the plant; **B** - known locations of *Polypodium sibiricum* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N

Potentilla multifida L. (branched cinquefoil) S1 G5

1. BRIEF DESCRIPTION: *Potentilla multifida* is a densely tufted perennial herb of the rose family (Rosaceae). It grows from stout, woody root crowns (Kershaw et al. 2001), which made a count of individual plants a method of choice for the estimation of population size within FGWPP.

2. DISTRIBUTION:
FGWPP – Peter Lee collected a specimen of *Potentilla multifida* at Fidler Point in 1984. This location was confirmed during the 2001 reconnaissance survey and four new locations were found along the shore of the mainlined (see Figure 24C).

AB – Known from seven additional locations, six in the northeastern part of Alberta and one from the Steen River area in northwestern Alberta. Occurrences of this species fall into the Wetland Mixedwood, Kazan Upland, Peace River Lowland and Central Mixedwood natural subregions (see Figure 24B).

Global – Known from most Canadian provinces and the territories, except British Columbia and the Maritimes (NatureServe 2003). It has also been reported from Alaska, Arizona and New Mexico in the United States (the last two being southern disjuncts, ranked S? and SR, respectively). In addition to Alberta, it is considered rare in Saskatchewan (S2) and Ontario (SH) (NatureServe 2003).

3. HABITAT:
FGWPP – It grew mostly on rock outcrops near the shoreline, in crevices where soil and moisture collect, but was also found on sand above the high water mark along the lakeshore. Other species found on rock outcrops include *Polypodium sibiricum* and *Carex umbellata*.

AB – Kershaw et al. (2001) noted that it grows on gravel bars and open slopes in Alberta. Till plain and dry open meadow are additional habitats listed in ANHIC (2003).

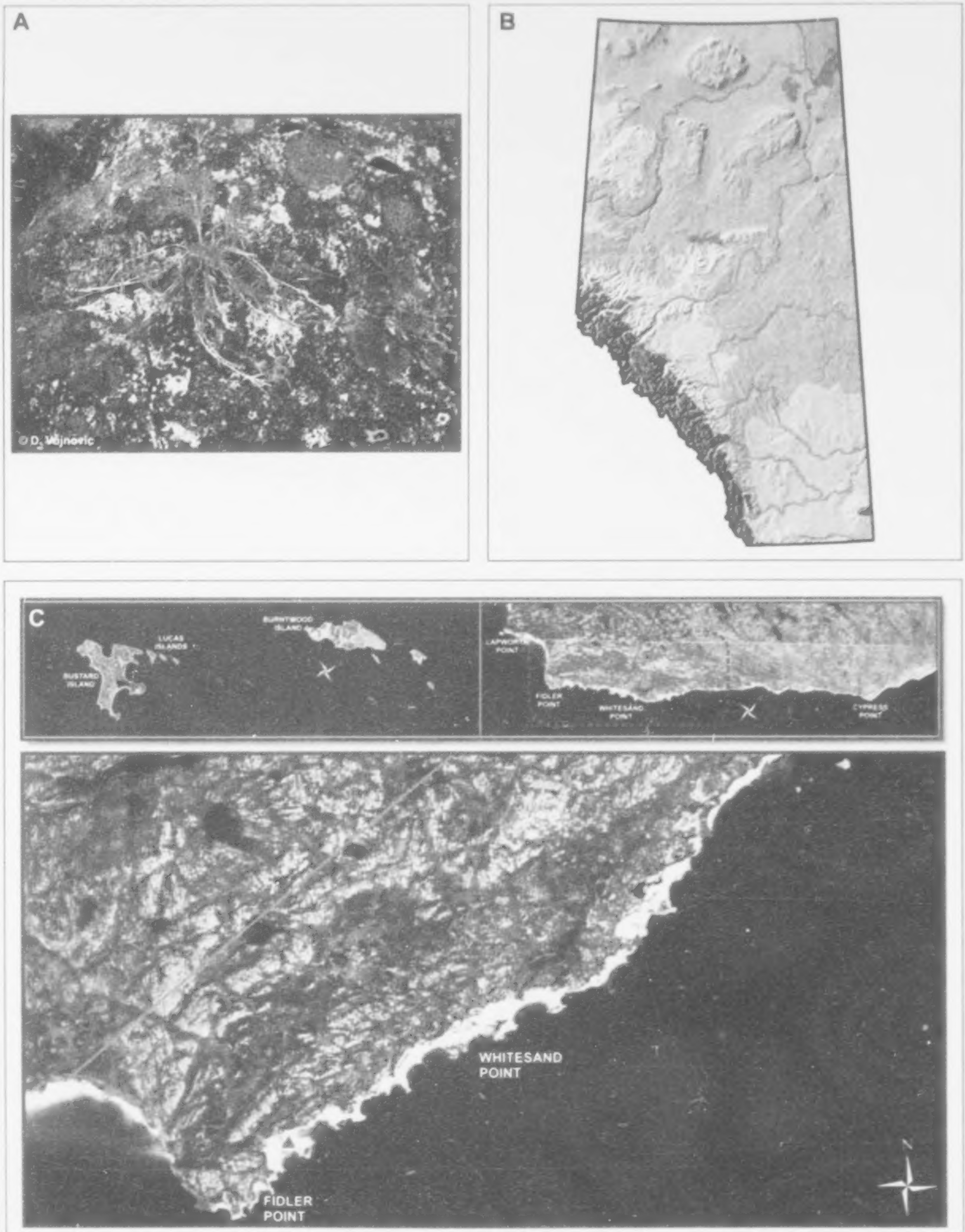
Elsewhere – Outside Alberta, it grows on scree slopes and open gravelly or sandy ground, often near streams and lakes or on roadsides (Kershaw et al. 2001). Scoggan (1978-79) listed rock crevices, ledges and dry open soil as habitats where this species grows in Canada.

4. POPULATION SIZE:
FGWPP – Ten plants were found in total, all in flower.

AB – The overall population size in Alberta (based on the information from known locations) is estimated to be less than 250 plants (population information is missing for three of the known populations).

5. PROTECTED AREAS: Fidler-Greywillow WPP.

Figure 24 *Potentilla multifida* L. (branched cinquefoil). **A** - image of the plant; **B** - known locations of *Potentilla multifida* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© D. Vujnovic
B
C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT
N

Puccinellia distans ssp. *hauptiana* (Trin. ex Krecz.) W.E. Hughes S1 G5T3T4

1. BRIEF DESCRIPTION: *Puccinellia distans* ssp. *hauptiana* is a tufted perennial herb of the grass family (Poaceae). It grows from fibrous roots (description provided for *Puccinellia distans* in Douglas et al. 2001a).

2. DISTRIBUTION:
FGWPP - This species was not known from the area prior to this study. A specimen of *Puccinellia* sp. collected on the shore of Burntwood Island (see Figure 25C) during the 2001 reconnaissance survey was subsequently determined to be the rare *Puccinellia distans* ssp. *hauptiana*.

AB - The only other record of this species in Alberta is based on a single historic specimen collected from the Fort Smith area (Moss 1983).

Global - This subspecies is known only from Alaska (S3S4), Yukon (S1), Saskatchewan (S2) and Ontario (SR) (NatureServe 2003).

3. HABITAT:
FGWPP - It was found growing among cobbles on a moist sandy shore, with *Carex lenticularis* var. *lipocarpa*, *Juncus filiformis*, *Hypericum majus*, *Sagina nodosa*, *Primula mistassinica* and *Carex saxatilis*.

AB - Moss (1983) reported it as growing in marshy areas.

Elsewhere - Growing on wet ground and riverbanks (Scoggan 1978-79).

4. POPULATION SIZE:
FGWPP - Since this plant was not recognized in the field as a rare subspecies, no population information is available at the moment. Considering that it was found at only one spot during the 2001 survey, the taxon is likely at least uncommon if not rare in this general area.

AB - There is no good information on the provincial abundance of *Puccinellia distans* ssp. *hauptiana*. This is a difficult taxon being a subspecies of a species that is considered non-native to our province and to Canada and may easily be overlooked by botanists in the field.

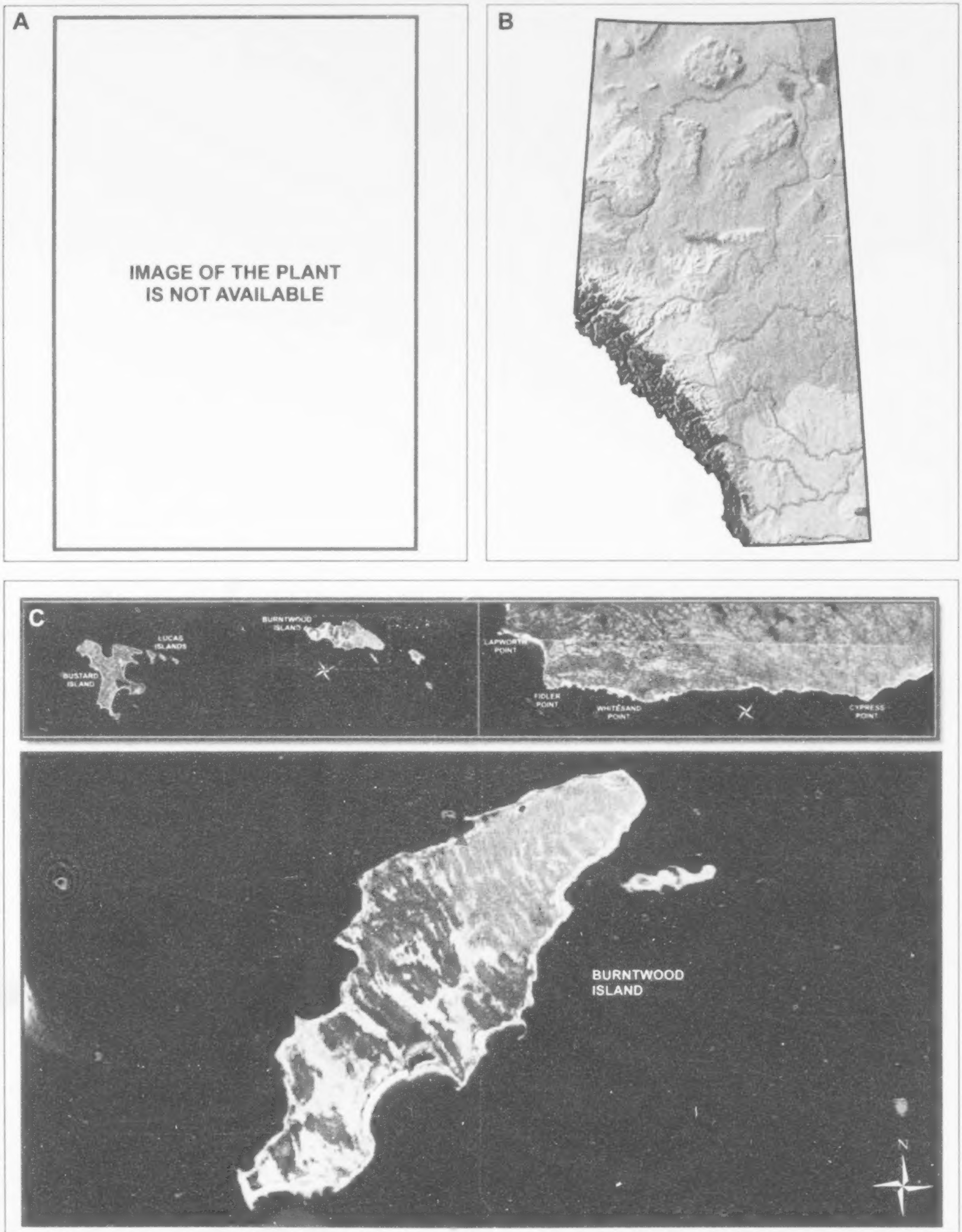
5. PROTECTED AREAS: Fidler-Greywillow WPP.

6. NOTES: Differentiating taxa within the genus *Puccinellia* is a daunting task and we often rely on annotations by a specialist in that group for correct identification. *Puccinellia distans* ssp. *hauptiana* (also called *Puccinellia hauptiana* (Krecz.) Kitagawa - Moss 1983) can easily be confused with the more common taxon, *Puccinellia distans*. There are also some questions about the native vs. exotic status of this and other subspecies of *Puccinellia distans* in North America. Given the difficulty in identification and uncertainty about its native vs. exotic status, the true status of *Puccinellia distans* ssp. *hauptiana* in Alberta is still uncertain.

Figure 25 *Puccinellia distans* ssp. *hauptiana* (Trin. ex Krecz.) W. E. Hughes. (branched cinquefoil). **A** - image of the plant; **B** - known locations of *Puccinellia distans* ssp. *hauptiana* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE


B
C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
BURNTWOOD ISLAND
N

Rhynchospora capillacea Torr. (slender beak-rush) S1 G4G5

1. BRIEF DESCRIPTION: *Rhynchospora capillacea* is a tufted perennial herb of the sedge family (Cyperaceae). It grows from very short underground stems (rhizomes) and fibrous roots (Kershaw et al. 2001).

2. DISTRIBUTION:

FGWPP – Prior to this study, *Rhynchospora capillacea* was not know from the northeastern part of the province. In 2001, it was found growing in two small bays on the north and south shores of Burntwood Island (see Figure 26C).

AB – Also known from the Wagner Natural Area, the Connor Creek area and Heatherdown area in central Alberta. Known locations of this species fall into the Athabasca Plain, Dry Mixedwood and Central Parkland natural subregions of Alberta (see Figure 26B).

Global – *Rhynchospora capillacea* is known from all Canadian provinces, except Labrador. It has not been reported from the territories or from Alaska. It also occurs in most states on the eastern half of the continent. Although fairly widespread, it is considered rare throughout most of its range, including British Columbia (S1), Manitoba (S2), New Brunswick (S1), Newfoundland Island (Newfoundland) (S1S2), Nova Scotia (S1), Quebec (S1), Saskatchewan (S2) Alabama (S1), Arkansas (S2), Connecticut (S1), Illinois (S1S2), Iowa (S2), Maine (S1), Massachusetts (S1), Minnesota (S2), New Hampshire (S1), New Jersey (S1), North Dakota (S2), Oklahoma (S1), Pennsylvania (S1), South Dakota (S1), Tennessee (SH), Vermont (S1) and Virginia (S1) (NatureServe 2003).

3. HABITAT:

FGWPP – Within the study area, *R. capillacea* grew along sandy beaches of somewhat protected bays, on moist sands between cobbles. Associated species included *Carex lenticularis* var. *lipocarpa*, *Juncus filiformis*, *Hypericum majus*, *Sagina nodosa*, *Primula mistassinica*, *Carex saxatilis*, *Epilobium ciliatum* and *Senecio congestus*.

AB – Outside the study area it was reported from open calcareous fens, often on open marl flats (ANHIC 2003).

Elsewhere – It grows in calcareous sites in meadows and swamps and on shores (Kershaw et al. 2001). Douglas et al. (2001a) noted that it grows in calcareous fens, swamps and on shorelines in the montane zone of British Columbia. Scoggan (1978-79) listed calcareous swamps, bogs and shores as habitats where this species was found in Alberta. According to the Flora of North America (FNA 2002), this species grows in marshy meadows, moist to wet calcareous fens and seeps over calcareous or limestone rocks.

4. POPULATION SIZE:

FGWPP – This plant was not recognized in the field as a rare species, so no population information was collected at the time. Considering that this genus was found at only two locations during the 2001 survey, it is likely at least uncommon if not rare in this general area.

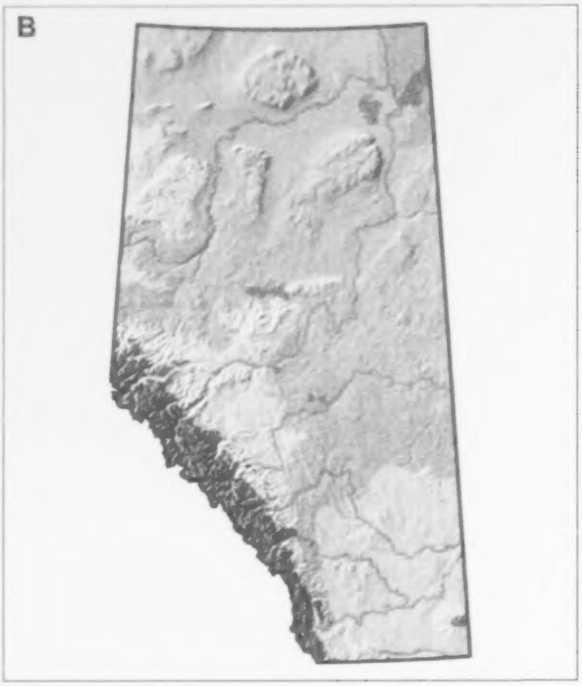
AB – Species noted as "abundant" at the other three locations in the province (ANHIC 2003).

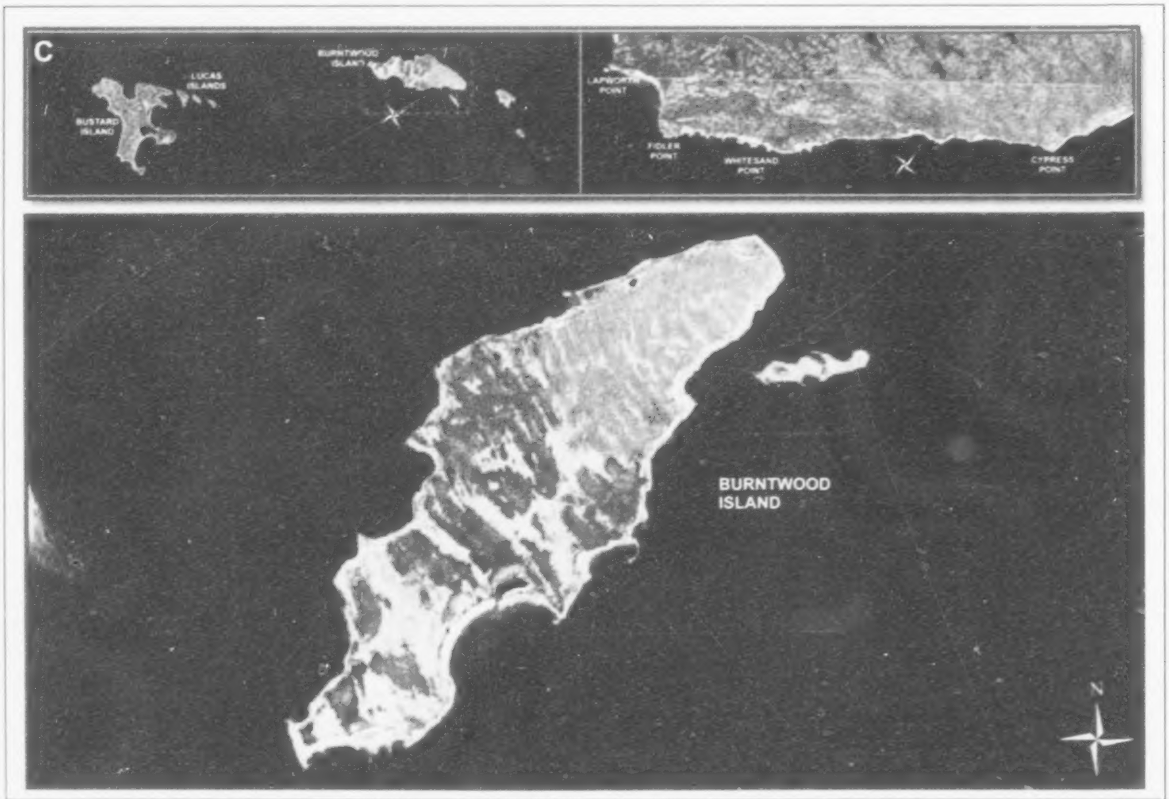
5. PROTECTED AREAS: Fidler-Greywillow WPP and Wagner NA.

Figure 26 *Rhynchospora capillacea* Torr. (slender beak-rush). **A** - image of the plant; **B** - known locations of *Rhynchospora capillacea* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

A

IMAGE OF THE PLANT
IS NOT AVAILABLE




C
BURNTWOOD ISLAND
LUCAS ISLANDS
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
BURNTWOOD ISLAND
N

Sagina nodosa (L.) Fenzl (pearlwort) S1 G5

1. BRIEF DESCRIPTION: *Sagina nodosa* is a slender, tufted perennial herb of the pink family (Caryophyllaceae). It grows from branched root crowns (thus we used individual plant counts to estimate population size in FGWPP).

2. DISTRIBUTION:

FGWPP – Peter Lee collected *Sagina nodosa* within the study site for the first time in 1984, at Fidler Point. This location was confirmed in 2001 and many others were found during the course of the study. Generally, *Sagina nodosa* was found in more or less disconnected locations along the shoreline from the western boundary of the park all the way to Cypress Point at the east end of the park (it was also found outside the park boundaries). Additional locations were found on Burntwood Island (see Figure 27C).

AB – Outside the study area, *Sagina nodosa* is known only from the Colin Lake area where Cliff Wallis collected it in 1983 (see Figure 27B).

Global – *Sagina nodosa* is known from all Canadian provinces and territories except British Columbia and the Yukon. It is known from a few states, namely Maine, Michigan, Minnesota and New Hampshire. Besides Alberta, it is considered rare in New Brunswick (S2), Prince Edward Island (S1), Saskatchewan (S2) Maine (S2?), Minnesota (S1), New Hampshire (SH) and Michigan (S2) (NatureServe 2003).

3. HABITAT:

FGWPP – Within the study area and vicinity *Sagina nodosa* grew in somewhat protected sandy bays, in areas of wet sands with scattered cobbles that form a transition zone from rocky shoreline to sandy beaches. Associated species often included *Hypericum majus*, *Carex lenticularis* var. *lipocarpa*, *Juncus filiformis*, *Juncus. brevicaudatus*, *Viola* cf. *pallens* and sometimes *Primula mistassinica*.

AB – Kershaw et al. (2001) noted that *Sagina nodosa* grows on moist rocky, gravelly, sandy or peaty places, especially on shores in Alberta.

Elsewhere – Outside Alberta it can be found on damp sand in dune slacks, on dry sand on the lee side of fixed dunes and on salty ledges along the coast (Kershaw et al. 2001). Scoggan (1978-79) noted that it grows on damp rocky, gravelly, or peaty places.

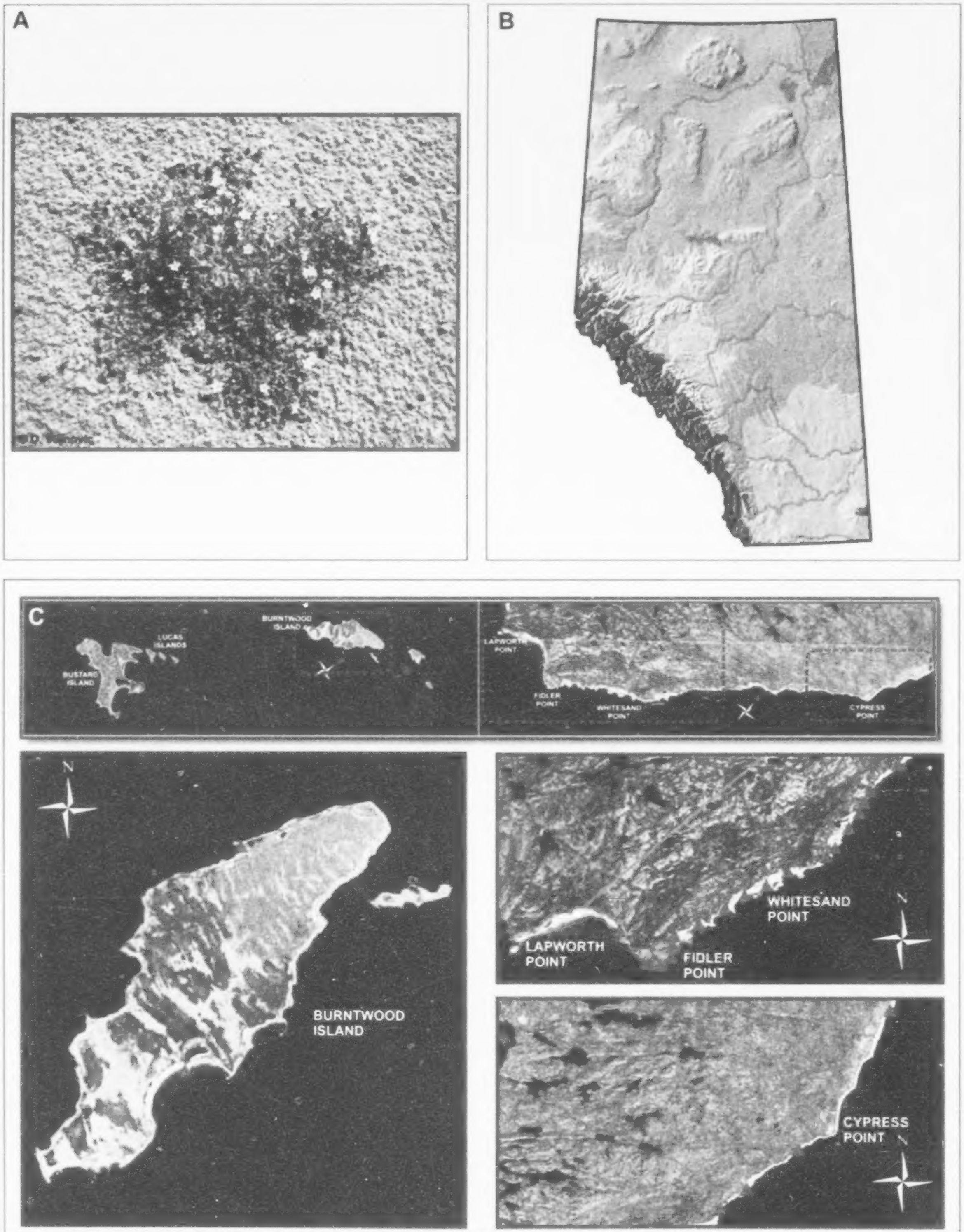
4. POPULATION SIZE:

FGWPP – The population of *Sagina nodosa* in Fidler-Greywillow WPP was estimated at a couple 1000s of plants in 2001. Fewer plants (a few 100s) were observed in two locations on Burntwood Island.

AB – No information on population size is available for the location at Colin Lake.

5. PROTECTED AREAS: Colin-Cornwall Lakes and Fidler-Greywillow WPP.

Figure 27 *Sagina nodosa* (L.) Fenzl (pearlwort). **A** - image of the plant; **B** - known locations of *Sagina nodosa* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
B
C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N
CYPRESS POINT
N

© D. Vujnovic

Tanacetum bipinnatum ssp. *huronense* (Nutt.) Breitung (Indian tansy) S2 G5T4T5

1. BRIEF DESCRIPTION: *Tanacetum bipinnatum* ssp. *huronense* is a tall perennial herb of the aster family (Asteraceae [Compositae]). It grows from slender, elongated underground stems (rhizomes) (Kershaw et al. 2001) (thus, we counted the number of "plants" to estimate population size for this species in FGWPP).

2. DISTRIBUTION:
FGWPP – It was reported from the study area for the first time in 1984 by Peter Lee who collected a few specimens near Fidler Point. The 2001study confirmed the previously known location and resulted in finding numerous additional locations along the shore of the mainland (both inside and outside of the park boundaries), and on Burntwood Island; no plants were observed on Bustard Island (see Figure 28C).

AB – This species was first reported to occur on the north shore of Lake Athabasca in 1932 when early explorers, H.M. Raup and E.C. Abbe, collected a specimen at Shelter Point, on the mainland, just across from Bustard Island. South of Lake Athabasca this species is known only from a cluster of sites located within the Athabasca Dunes ER (see Figure 28B).

Global – *Tanacetum bipinnatum* ssp. *huronense* is known from all Canadian provinces and territories, as well as from Alaska, Maine, Michigan and Wisconsin. In addition to Alberta, it is considered rare in Newfoundland Island (Newfoundland) (S2S3), Quebec (S2S3), Saskatchewan (S2S3), Yukon Territory (S1), Maine (S2) and Wisconsin (S1) (NatureServe 2003). Also listed as rare in the Northwest Territories (McJannet et al. 1995).

3. HABITAT:
FGWPP – *Tanacetum bipinnatum* ssp. *huronense* was often found on sandy beaches, growing in a zone made up of partially stabilized, low, discontinuous dunes. The dunes have built up behind an area of bare dry sand that is just out of the wave action zone and occasionally reach a couple of meters in height. It mainly grew as a co-dominant species in the *Leymus (Elymus) mollis* – *Tanacetum bipinnatum* ssp. *huronense* sand dune community. Other frequent species included *Stellaria longipes*, *Artemisia campestris*, *Festuca rubra* and *Bromus inermis* var. *pumpellianus*. More detail on this community type can be found in Allen et al. (2003b).

AB – In the Athabasca Dunes ER, *Tanacetum bipinnatum* ssp. *huronense* inhabited the lee side of dune crests which occasionally supported one or several other species such as *Pascopyrum (Agropyron) smithii*, *Bromus inermis* var. *pumpellianus*, *Calamagrostis stricta*, *Festuca rubra* and *Koeleria macrantha*; it was also found in a sparse linear community dominated by *Calamagrostis stricta* on a dune slack at the foot of the slip face (Allen et al. 2003a). Kershaw et al. (2001) noted that it grows on sandy or gravelly shores, sand dunes and gravel bars.

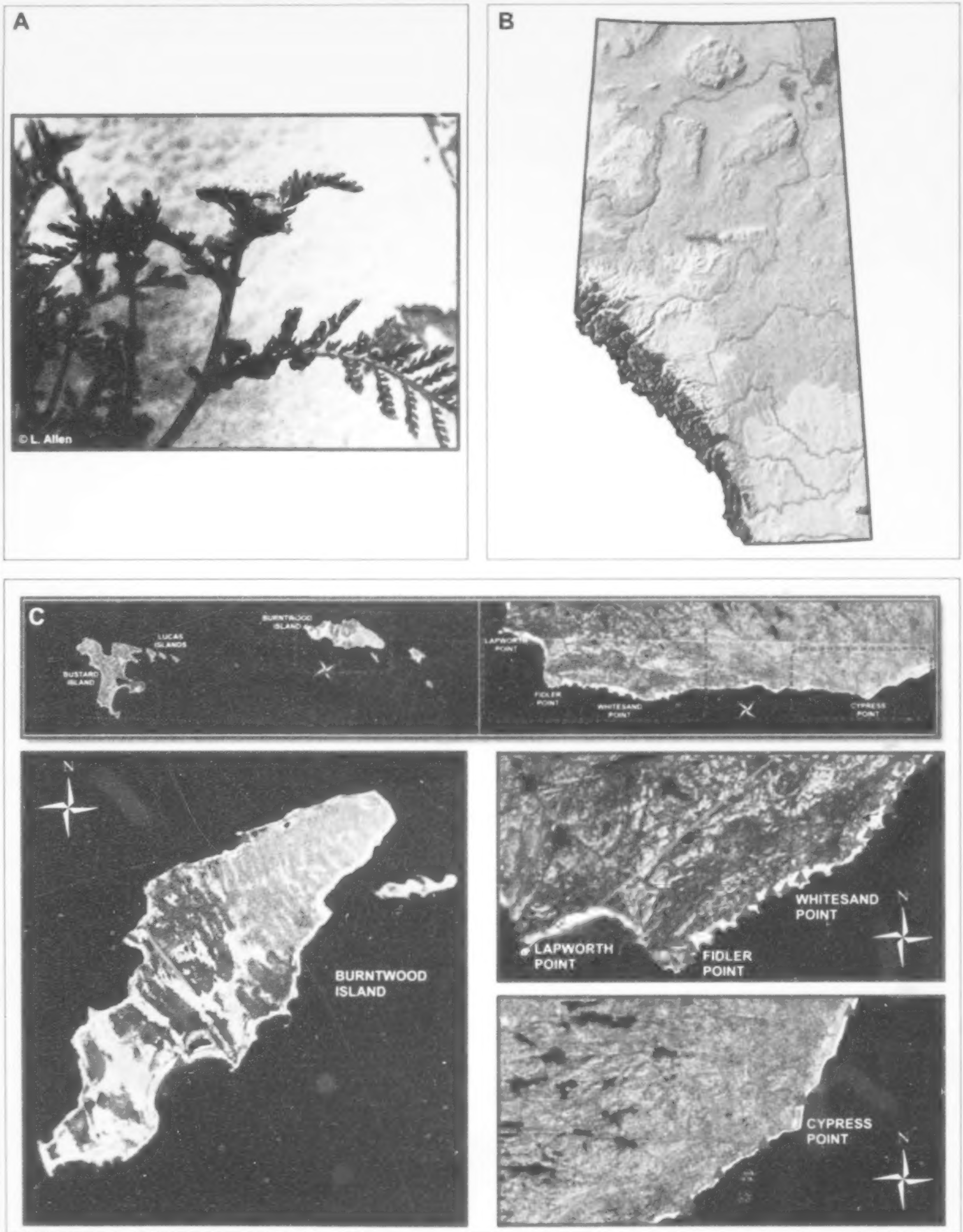
Elsewhere – Douglas et al. (1998a) reported it growing in moist to mesic sand dunes in the lowland zone of British Columbia. Scoggan (1978-79) noted that it grows on peaty, sandy or gravelly shores and slopes (chiefly calcareous) in Canada. According to NatureServe (2003), it occurs on naturally disturbed sand, gravels, or alvar (pavement), such as riverbanks and lakeshores.

4. POPULATION SIZE:
FGWPP – Tens to hundreds of "plants" (many in flower) were estimated at each of the locations within the study area. Overall population size within the study area in 2001 can be estimated at a couple thousand "plants".

AB – It was found in the above-described habitats throughout the active dune field complex of the Athabasca Dunes ER (Allen et al. 2003a). No population information is available for the historic location at Shelter Point.

5. PROTECTED AREAS: Athabasca Dunes ER; Fidler-Greywillow WPP.

Figure 28 *Tanacetum bipinnatum* ssp. *huronense* (Nutt.) Breitung (Indian tansy). **A** - image of the plant; **B** - known locations of *Tanacetum bipinnatum* ssp. *huronense* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
BUSTARD ISLAND
LUCAS ISLANDS
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
N
WHITESAND POINT
LAPWORTH POINT
FIDLER POINT
N
CYPRESS POINT
N

Vaccinium uliginosum L. (bog bilberry) S2 G5

1. BRIEF DESCRIPTION: *Vaccinium uliginosum* is a deciduous shrub of the heath family (Ericaceae). Plants are procumbent to rhizomatous and erect, forming dense mats or open extensive colonies (Vander Kloet 1988). Estimating size of patches occupied by this spreading shrub rather than counting individual plants seemed to be the most appropriate method for estimating population size of this species in FGWPP.

2. DISTRIBUTION:
FGWPP – The first report of *Vaccinium uliginosum* in the study area came from Peter Lee who collected a specimen near Fidler Point in 1984. The 2001 study confirmed the previously known location and resulted in finding numerous additional locations for this species along the shore of the mainland (inside and outside the park boundaries); no plants were observed on Bustard or Burntwood islands (see Figure 29C).

AB – In Alberta, *Vaccinium uliginosum* typically occurs in two widely separated regions: the northernmost part of Alberta (with at least six locations outside of the Canadian Shield) and the northern Rockies (four locations). The species is also known from a number of additional locations on the Caribou Mountains (first author's personal observations from 2003 - locations not shown on the provincial distribution map). Generally, locations within Alberta fall within the Sub-Arctic, Wetland Mixedwood, Boreal Highlands, Athabasca Plain, Subalpine and Alpine natural subregions (see Figure 29B).

Global – *Vaccinium uliginosum* is known from all Canadian provinces and territories. It also extends into the United States, as far north as Alaska and as far south as California, Utah, Wyoming, Minnesota, Michigan, and New York. In addition to Alberta, it is considered rare in New Brunswick (S1), Nova Scotia (S2), Prince Edward Island (S1), Michigan (S2), Minnesota (S2) and Vermont (S1) (NatureServe 2003).

3. HABITAT:
FGWPP – Within the study area, *Vaccinium uliginosum* was found not far from the shoreline, often at the base of rock outcrops where the rock meets the sandy plain. It occasionally grew in dry bog situations with black spruce or in open jack pine stands on rock outcrops. Some of associated species included *Ledum groenlandicum*, *Vaccinium vitis-idaea*, *Pinus banksiana* and *Betula papyrifera*.

AB – Kershaw et al. (2001) reported that it grows in bogs and on alpine slopes in Alberta. The following habitats are listed in the ANHIC database: muskeg in *Populus tremuloides* woods, open *Picea mariana*/*Sphagnum* bog, burned-over bog, boggy *Betula pumila*–feather moss community, rock outcrop, perched bog on permafrost in subarctic woodland, and *Picea mariana* /lichen forest (at northern locations); quartzite terrace on mountain top and quartzite lateral moraine, *Abies bifolia* – *Picea engelmannii* forest, wet *Picea* – *Salix* community, and *Dryas octopetala* tundra (at locations in Rocky Mountains).

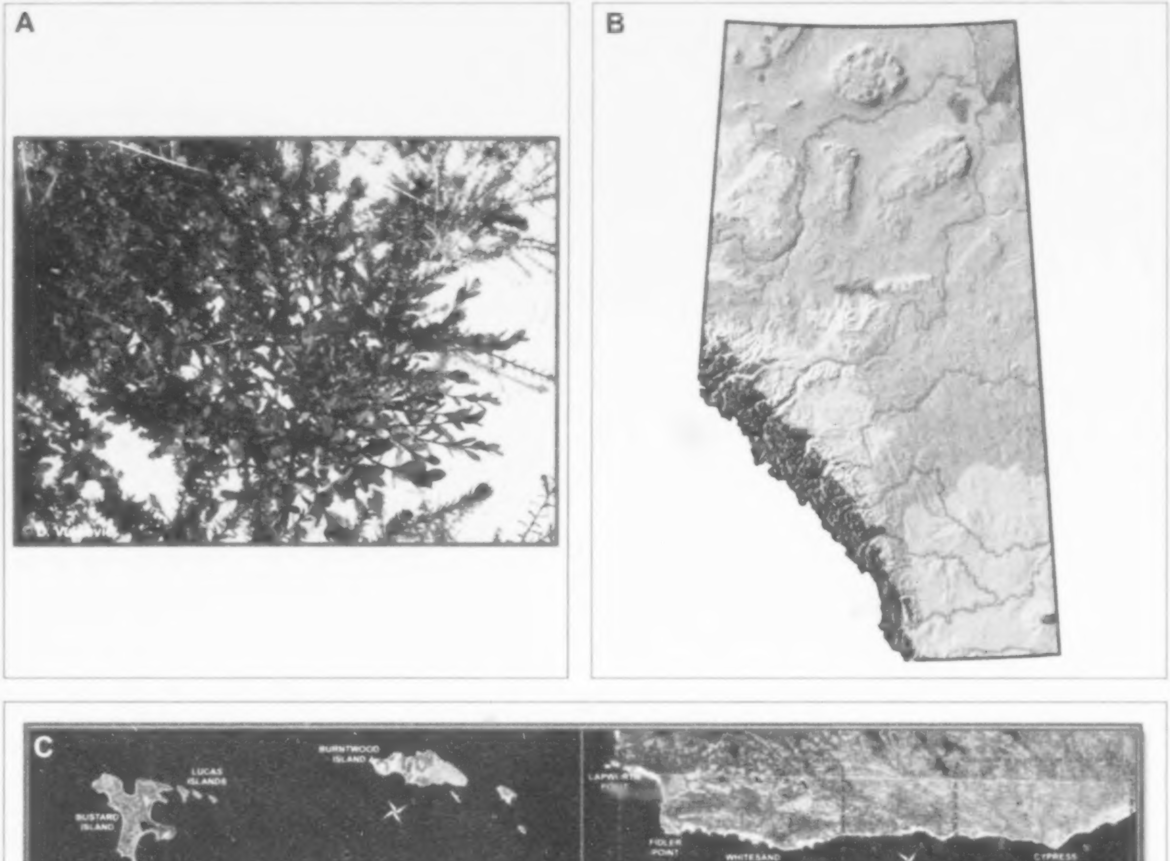
Elsewhere – It grows in bogs, boggy forests, dry to wet rocky tundra, and meadows and thickets in the lowland to alpine zones of British Columbia (Douglas et al. 1999). Scoggan (1978-79) noted that it grows in peat bogs and rocky barrens and tundra at low to high elevations.

4. POPULATION SIZE:
FGWPP – Sixty-eight (68) patches of *Vaccinium uliginosum* were counted during this study. The area they covered ranged in size from 0.04 to 25 m^2. The total size of the observed area covered by this species was approximately 140 m^2.

AB – This species grew abundantly along many lakeshores and throughout bogs in the Caribou Mountains (first author's personal observations). About a dozen plants were reported from Mt. Edith Cavell, ranging in size from small up to 2m by 5m wide patches (ANHIC 2003). Information on population size is not available for the remaining locations, which are mostly based on historic records.

5. PROTECTED AREAS: Willmore WP; Jasper NP; Fidler-Greywillow WPP.

Figure 29 *Vaccinium uliginosum* L. (bog bilberry). **A** - image of the plant; **B** - known locations of *Vaccinium uliginosum* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
B
C
LUCAS ISLANDS
BURNTWOOD ISLAND
BUSTARD ISLAND
LAPWING POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
WHITESAND POINT
FIDLER POINT
CYPRESS POINT
N
N

SPECIES WITH QUESTIONABLE IDENTIFICATION AND THOSE ON THE WATCH LIST:

Viola cf. *pallens* (Banks ex DC.) M.S. Baker (Macloskey's violet) S1S2 G5T5

1. BRIEF DESCRIPTION: *Viola* cf. *pallens* is a small perennial herb of the violet family (Violaceae). It grows from slender, creeping underground stems (rhizomes) and thread-like runners (stolons) (Kershaw et al. 2001) (thus, we counted the number of "plants" to estimate population size for this species in FGWPP).

2. DISTRIBUTION:
FGWPP – This species was not known from the area north of Lake Athabasca in the past. In 2001, it was found growing in four locations, three on the mainland and one on Burntwood Island (see Figure 30C).

AB – In Alberta, *Viola* cf. *pallens* grows in three widely separated areas: Waterton Lakes NP (three locations), central Alberta (five locations) and the northeast region (five locations in addition to the ones in the study area). Currently known locations fall within the Athabasca Plain, Central Mixedwood, Montane, Sub-Alpine and Alpine natural subregions (see Figure 30B).

Global – This widespread North American species is known from all Canadian provinces and territories, except the Yukon. It is found as far north as Alaska and as far south as California, New Mexico, Mississippi, Alabama and Georgia. In addition to Alberta, it is considered rare in Saskatchewan (S1), Delaware (S1), Missouri (S2) and Wyoming (S2) (NatureServe 2003).

3. HABITAT:
FGWPP – *Viola* cf. *pallens* was growing on wet sand with scattered cobbles found near the mouth of small creeks where they cut between dune ridges before draining into Lake Athabasca. It also grew in somewhat protected sandy bays in wetter areas set back from the shoreline and near the forest edge. Commonly associated species include *Juncus balticus* var. *littoralis*, *Carex lenticularis* var. *lipocarpa*, *Equisetum palustre*, *Senecio congestus*, *Epilobium ciliatum*, *Ranunculus gmelinii*, *Primula mistassinica*, and some of the rare ones such as *Sagina nodosa*, *Juncus brevicaudatus* and *Hypericum majus*.

AB – Kershaw et al. (2001) noted that *Viola pallens* grows on wet ground in moist woods. ANHIC (2003) also provides the following list of habitats associated with this species: boggy or sandy lake shores; swamp; wet depression in hay meadow; marshy area along creek; quaking fen; *Betula neoalaskana*/*Salix*/*Carex* – *Calamagrostis* wetland; ephemeral wetlands with *Carex utriculata*; *Picea mariana*/*Ledum groenlandicum*/*Sphagnum* wetland; *Chamaedaphne calyculata*/*Eriophorum*/*Sphagnum* wetland; dried-up beaver pond; and bed of intermittent stream below springs.

Elsewhere – It grows most commonly in coniferous stands and bogs; often on sphagnum hummocks, but also in swamps and wet thickets, hollows, crevices and meadows (Kershaw et al. 2001). Douglas et al. (2000) noted that it grows on moist to wet streambanks, seepage sites, and in bogs and woodlands in the montane zone of British Columbia. Boggy or wet ground and wet thickets are listed as habitats associated with this species in Scoggan (1978-79).

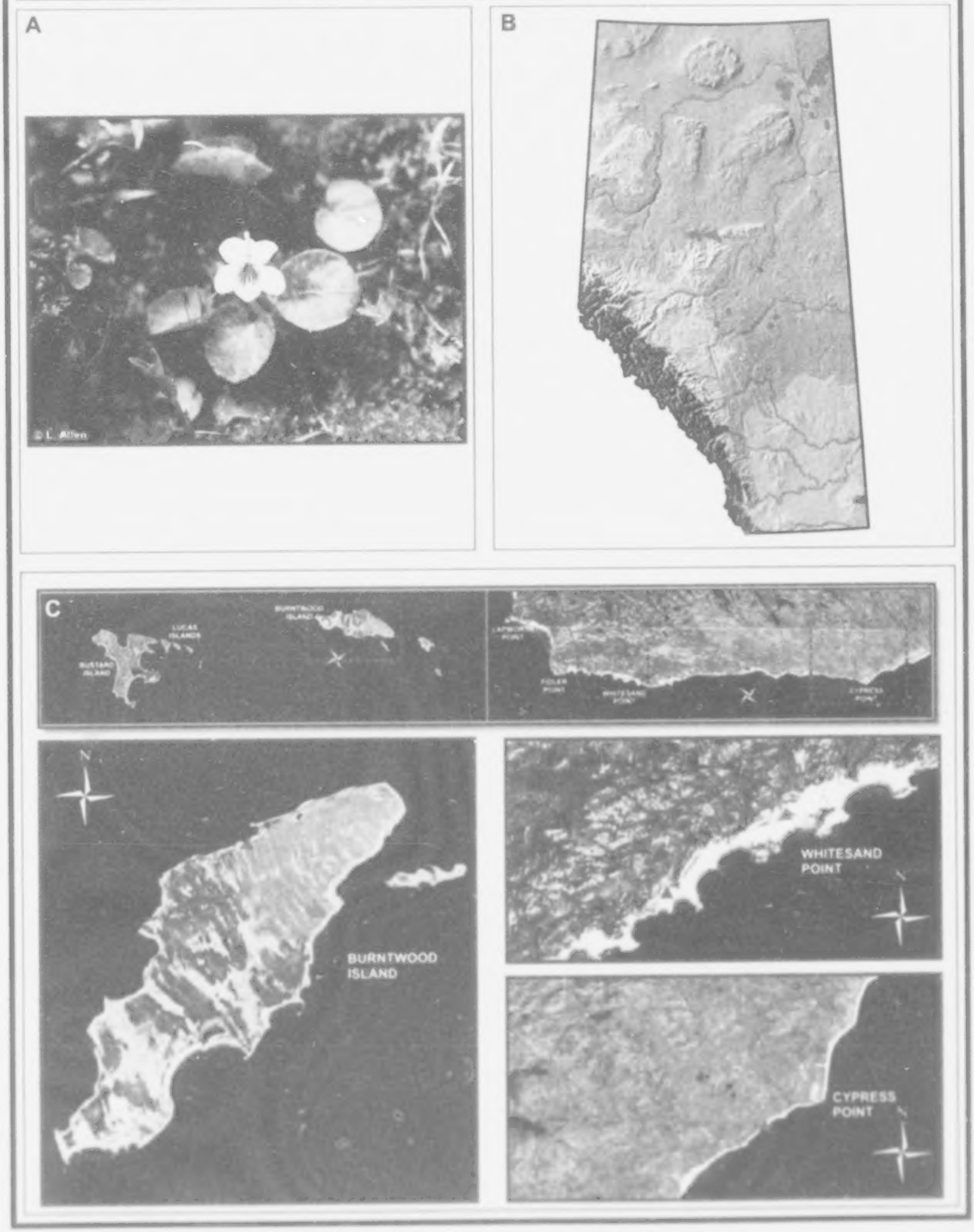
4. POPULATION SIZE:
FGWPP – Only a dozen "plants" on Burntwood Island and about as many again on the three mainland locations were found during this survey.

AB – More than 2100 plants were estimated in 2000 in Waterton Lakes NP. About 100 individuals were counted in 1999 at a North Cooking Lake location (central Alberta). About 100 plants were reported from one of two known locations in Marguerite River WPP and a small population (about 20 plants plus another group covering a 4m x1.5m area) at Richardson River Dunes WPP (ANHIC 2003). Population information is not available for the remaining locations within the province, some of which are based on historical records.

5. PROTECTED AREAS: Maybelle River, Richardson River Dunes, Marguerite River and Fidler-Greywillow WPPs.

6. NOTES: Although the *Viola* species could be *Viola pallens* as the habit and habitat were appropriate, the identification remains tentative (indicated by "cf." in species name), because this species closely resembles *Viola palustris* from which it is most easily separated by its white flowers (*Viola palustris* has blue to violet-coloured petals). Unfortunately, all plants observed in 2001 were past flowering, thus making species identification difficult. The photograph suppled in Figure 30A is from a confirmed population of *Viola pallens* found in Richardson River Dunes WPP. In order to confirm the species identification, known locations need to be revisited earlier in the season to find plants in flower.

Figure 30 *Viola* cf. *pallens* (Banks ex DC.) M. S. Baker (Macloskey's violet). **A** - image of the plant; **B** - known locations of *Viola* cf. *pallens* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
© L. Allen
B
C
BUSTARD ISLAND
LUCAS ISLANDS
BURNTWOOD ISLAND
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
N
BURNTWOOD ISLAND
WHITESAND POINT
N
CYPRESS POINT
N

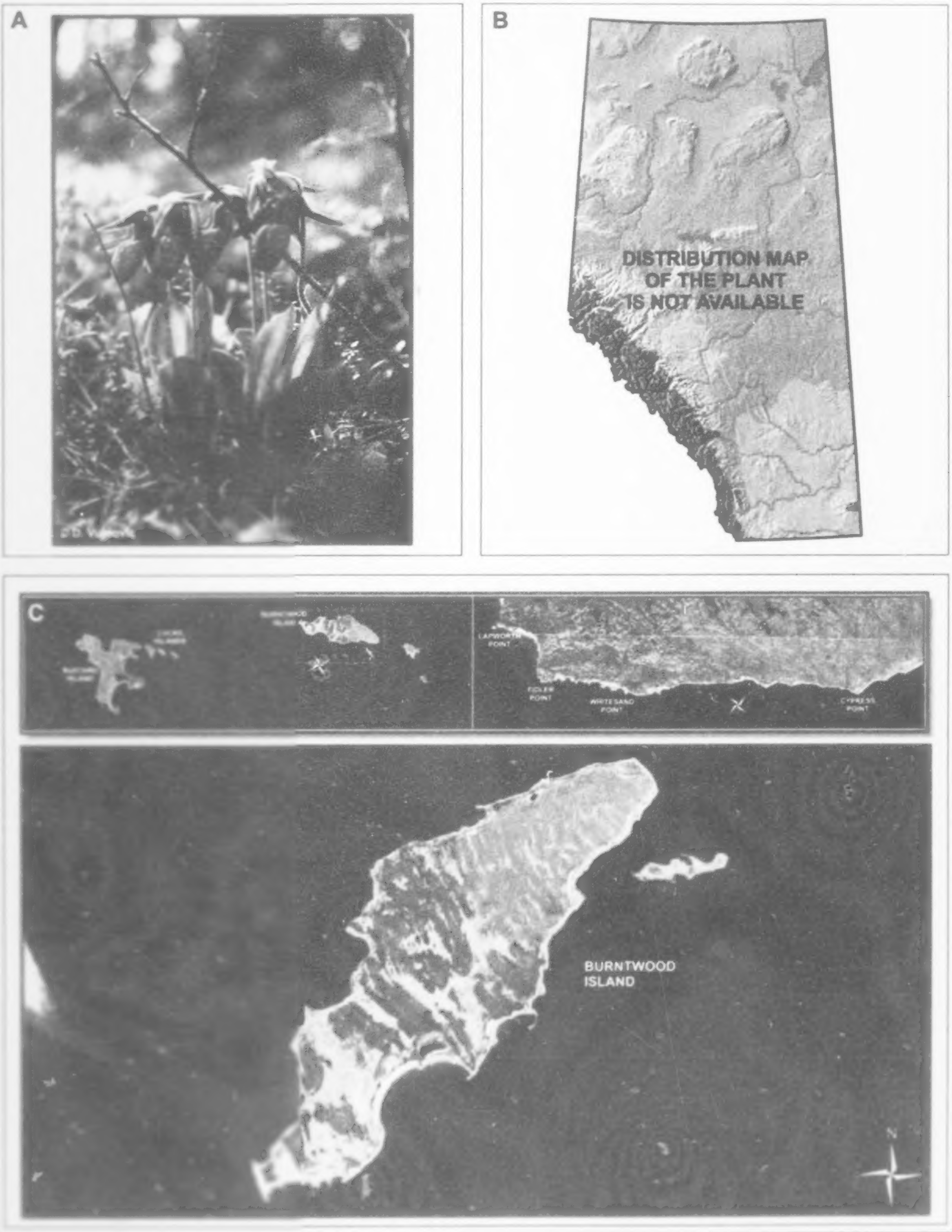
Cypripedium acaule Ait. (stemless lady's-slipper) S3 G5

Cypripedium acaule is a perennial herb of the orchid family (Orchidaceae). It has a wide range in eastern Canada and the eastern United States (but is not known from Alaska [United States], or from Yukon, Nunavut or British Columbia [Canada]). *Cypripedium acaule* is common in many areas of its range and is considered rare only in Illinois (S1) (NatureServe 2003).

Generally known from sterile, acidic soil and light shaded sites (including sand ridges, jack pine woods and sphagnum bogs), this species grows in wetlands, woods and on sand dunes in northeastern Alberta (Kershaw et al. 2001). Its known sites largely fall within the Athabasca Plain Natural Subregion with a few locations found in the Kazan Upland and Central Mixedwood natural subregions (ANHIC 2003). It was found only once (represented by a few plants) during the 2001 inventory of the study area, growing on the barrier sand dune on the south side of Burntwood Island (see Figure 31C).

Once considered rare in Alberta (ranked S2 in 1995), this species was ranked S3 in 2000 (and moved to the Watch List because large populations were found during the biophysical inventory of the Maybelle River WPP and the Athabasca Dunes ER (thousands of plants were found growing within two extensive landscape units: the sand-plain complex and the ice contact complex, Allen et al. 2003a) and additional locations were expected to be found both in the Athabasca Plain and the Kazan Upland natural subregions in the future. However, subsequent surveys of the three protected areas north of Lake Athabasca (Colin-Cornwall Lakes, La Butte Creek and Fidler-Greywillow WPPs) suggest that this species is far less common in the Kazan Upland than originally predicted. Since the range of the species appears to be smaller than predicted, a review should be done to determine if the rank should be changed and the species put back on the Tracking List.

Figure 31 *Cypripedium acaule* Ait. (stemless lady's slipper). **A** - image of the plant; **B** - known locations of *Cypripedium acaule* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.

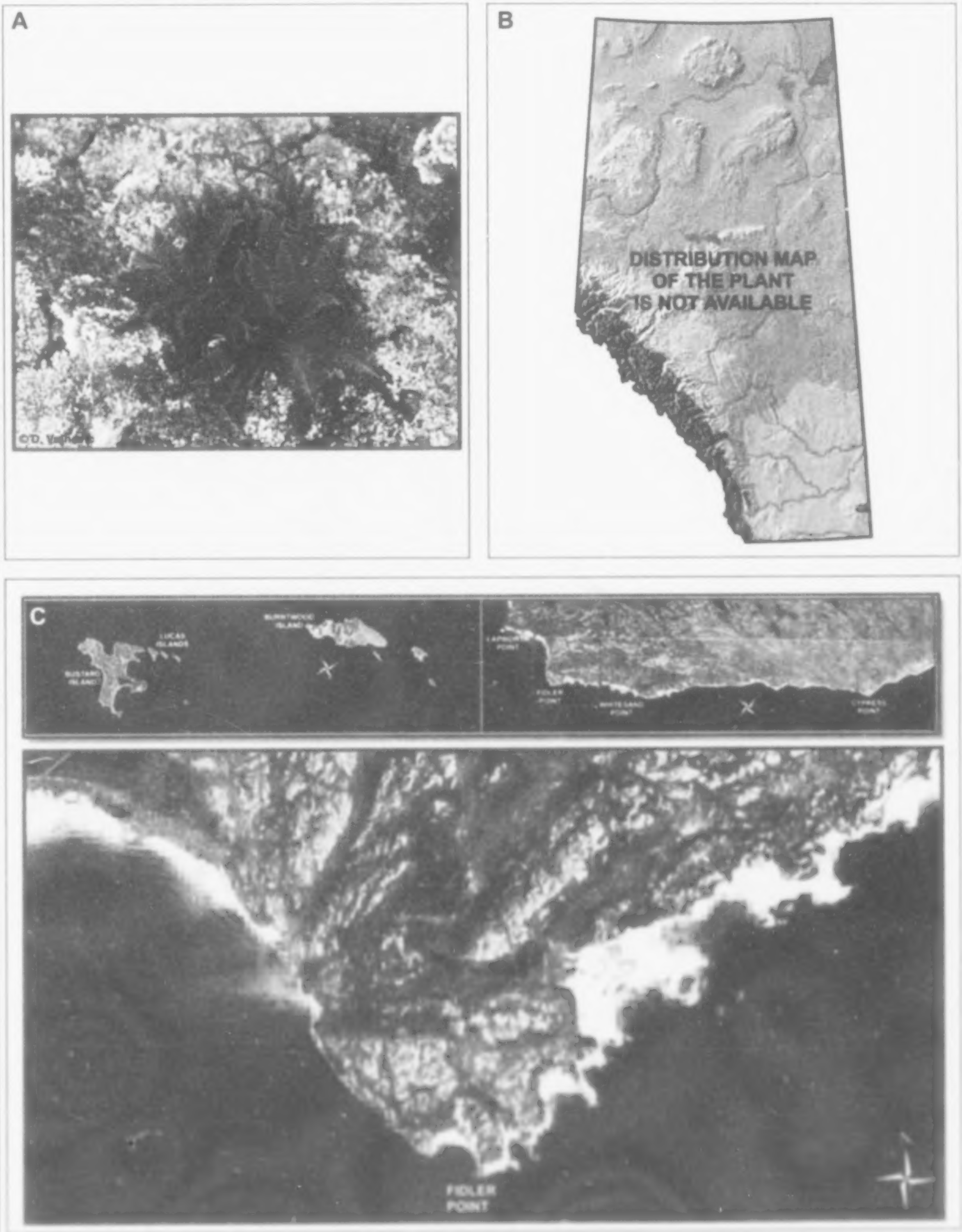

A
©D. Vujnovic
B
DISTRIBUTION MAP
OF THE PLANT
IS NOT AVAILABLE
C
BURNTWOOD ISLAND
LAPWORTH POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
BURNTWOOD ISLAND
N

Dryopteris fragrans (L.) Schott (fragrant shield fern) S3 G5

Dryopteris fragrans is a small evergreen forb of the woodfern family (Dryopteridaceae [Polypodiaceae]). It is known from all Canadian provinces and territories, Alaska, and a few northeastern states: Maine, Michigan, Minnesota, New Hampshire, New York, Vermont and Wisconsin. *Dryopteris fragrans* seems to be uncommon in many areas of its range, but is considered rare only in Newfoundland Island (Newfoundland) (S2S3), Nova Scotia (S2), Maine (S2), New Hampshire (S1), New York (S1), Vermont (S2) and Wisconsin (S2) (NatureServe 2003). In Alberta it is known from the Rocky Mountain and Canadian Shield natural regions (Moss 1983).

This more or less circumpolar species is known from cliffs and talus slopes across its range (Cody and Britton 1989). It grows on siliceous rocks (Moss 1983), on cliffs, ledges and rock slopes in Alberta (Johnson et al. 1995). During the 2001 survey of Fidler-Greywillow WPP only a couple of plants were found at two locations at Fidler Point (see Figure 32C).

Figure 32 *Dryopteris fragrans* (L.) Schott (fragrant shield fern). **A** - image of the plant; **B** - known locations of *Dryopteris fragrans* within Alberta; **C** - known locations of the species in Fidler-Greywillow Wildland Provincial Park.


A
©D. V
B
DISTRIBUTION MAP
OF THE PLANT
IS NOT AVAILABLE
C
BUSTARD ISLAND
LUCAS ISLANDS
BURNTWOOD ISLAND
POINT
FIDLER POINT
WHITESAND POINT
CYPRESS POINT
FIDLER POINT

Woodsia ilvensis (L.) R. Br. (rusty woodsia) S3 G5

Woodsia ilvensis is a delicate perennial herb of the woodfern family (Dryopteridaceae [Polypodiaceae]). Its North American range includes all Canadian provinces and territories, Alaska, and a number of eastern states (reaching as far west as Michigan and Iowa, and as far south as North Carolina). It is considered rare (or extirpated) in Illinois (S1), Iowa (S1), Maryland (S1), North Carolina (S1), Ohio (SX), Rhode Island (SH) and West Virginia (S2) (NatureServe 2003). Douglas et al. (1981) noted that it is rare in the Yukon Territory.

In North America, *Woodsia ilvensis* generally grows on cliffs and rocky slopes, on a variety of substrates, including serpentine (FNA 1993). It is restricted to the Canadian Shield in Alberta where it grows in crevices of rock outcrops, most commonly associated with *Polypodium sibiricum*, *Festuca saximontana*, *Carex deflexa*, *Cryptogramma acrostichoides*, *Poa glauca*, and *Potentilla tridentata*. It frequented most of the rock outcrops within the Fidler-Greywillow study area that were visited in 2001 (distribution map for Fidler-Graywillow is not provided because of the species very high frequency within the surveyed area). Based on the amount of unexplored suitable habitat, it is highly probable that there are numerous other locations occupied by this species within the study area.

DISCUSSION

Site significance

Fidler-Greywillow Wildland Provincial Park supports at least 347 vascular plant taxa, which represents roughly 20% of the overall native vascular plant diversity in Alberta. At least 28 (and possibly 29) of these taxa are considered provincially rare. This number represents roughly 6% of all rare vascular plant taxa (480) in the province (Vujnovic and Gould 2002). Rarity is generally considered a factor that makes species more vulnerable to both natural (caused by systematic pressures and stochastic events) and human induced extinction (Mittermeier and Forsyth 1994, Master et al. 2000). Populations of provincially rare vascular plant taxa in FGWPP are all significant because they fall within a protected area that aims to preserve our natural heritage, including the diversity of native plants (Parks and Protected Areas 2004). Although wildland provincial parks are designed to provide opportunities for backcountry recreation (Parks and Protected Areas 2004), the remoteness of the site and careful management by Parks and Protected Areas staff should ensure long-term protection of the populations of rare vascular plants that it supports.

The protective status of the study area is particularly significant for populations of those taxa that are ranked S1 in the province. These taxa are considered to be at potentially high risk of extinction either because they are known from only five or fewer locations in the province or because of some other factors influencing their long term survival, such as restricted geographic range, small population sizes, threats to populations and/or habitat, etc. (see NatureServe 2004a for a more complete list of factors considered in assessing conservation status). The Natural Heritage Network has developed a system for approximating a species' risk of extinction, and species ranked S1 are considered to be at potentially higher risk compared to those rare taxa ranked S2 and higher. Sixteen (16) out of the 29 rare taxa found in FGWPP fall into that group: *Carex echinata* ssp. *echinata*, *Carex umbellata*, *Carex lenticularis* var. *dolia*, *Carex lenticularis* var. *lenticularis*, *Carex supina*, *Gymnocarpium jessoense*, *Huperzia* (*Lycopodium*) *selago*, *Isoetes echinospora*, *Leymus mollis*, *Luzula groenlandica*, *Lycopodiella inundata*, *Potentilla multifida*, *Puccinellia distans* ssp. *hauptiana*, *Rhynchospora capillacea* and *Sagina nodosa*. Furthermore, FGWPP supports the only known locations of *Carex echinata* ssp. *echinata*, *Luzula groenlandica* and *Puccinellia distans* ssp. *hauptiana* in the province.

FGWPP is also significant for a number of additional reasons related to the conservation of rare vascular plant taxa in the province.

- It is the only protected area in Alberta with populations of *Leymus mollis*, *Carex lenticularis* var. *lenticularis* and *Potentilla multifida*
- It includes the largest documented populations in Alberta of *Botrychium simplex*, *Carex capitata*, *Huperzia selago*, *Hypericum majus*, *Sagina nodosa* and *Vaccinium uliginosum* (it should be noted, however, that the information on population sizes for most historical records is not available).
- Finally, the FGWPP populations of *Botrychium simplex*, *Carex lenticularis* var. *dolia*, *Danthonia spicata*, *Gymnocarpium jessoense* and *Rhynchospora capillacea* seem to be widely separated from and may be genetically different from the other known populations within the province, but research would be required to confirm this.

It must be noted here that none of the rare vascular plant taxa found within FGWPP have been assessed for the listing under the federal *Species at Risk Act* or the *Alberta Wildlife Act*. For details on the assessment process for listing under these two acts, visit the websites of Alberta Fish and Wildlife (http://www3.gov.ab.ca/srd/fw/riskspecies/index.html) and Environment Canada (http://www.speciesatrisk.gc.ca/default_e.cfm).

Conservation concerns

This park is relatively inaccessible and fairly distant from all major urban centers. Its flora (including rare taxa) generally does not seem to be negatively influenced by human factors at present. However, some beaches do seem to be under considerable pressure from campers (i.e. a location at the very tip of Fidler Point, one at Burntwood Island, and the recreational area on Bustard Island, which contained lots of garbage, girdled trees etc),. It could be speculated that human disturbances possibly caused the reduction of dunes supporting *Leymus mollis* on the beach at the tip of Fidler Point.

Although the vegetation health was not among the key data collected during this survey, no obvious threats from pests or diseases were observed on any of the rare plant taxa. Non-native plant species seem to be scarce at present and are mainly found near the campsite on Bustard Island (examples include *Polygonum arenastrum*, *Trifolium* *repens*, *Astragalus cicer* and *Plantago major*). However, if visitation by people significantly increased, it could potentially result in the introduction of some invasive non-native plants, which could pose a threat to the rare taxa, especially those located near the lakeshore.

Recommendations for future studies

While the portion of the shoreline of Lake Athabasca that is within the park's boundary received significant attention during this rare vascular plant survey, the inland portion of FGWPP was only partially surveyed because of the difficult access and limited time. Rare taxa such as *Carex rostrata*, *Carex oligosperma* and *Juncus stygius* ssp. *americanus* that were found in some inland wetlands potentially occur in other wetlands within the park, so additional suitable habitat should be surveyed for their occurrence in the future. Based on the abundance of suitable habitat for those vascular plant taxa that were often found growing on rock outcrops, such as *Carex umbellata*, *Polypodium sibiricum*, *Huperzia selago* and *Vaccinium uliginosum*, it is highly probable that these taxa grow in numerous additional locations within the park. This needs to be confirmed during some future visits to the area.

Identification of some rare vascular plant taxa was not confirmed until after the field component of this study was over, so special attention should be given to locating additional occurrences and collecting population and habitat data on all occurrences within the study area during future visits. Particular attention should be paid to some taxonomically difficult taxa such as *Carex lenticularis* var. *dolia* and *Carex lenticularis* var. *lenticularis* and to a newly discovered taxon for our province, *Carex echinata* ssp. *echinata*. *Juncus brevicaudatus* often co-occurred with a similar species, *Juncus alpinoarticulatus*, and distinguishing these two species and estimating the population size of the rare one was somewhat difficult in the field given the limited time for the 2001 survey. More effort should be allocated to properly estimating distribution and population size of *Juncus brevicaudatus* within FGWPP in the future.

Known occurrences of rare vascular plant taxa within the park boundary should be monitored periodically to detect any significant changes in population size and health. Priority should be given to those shoreline populations located near popular campsites that seem most likely to be vulnerable. More thorough examination of the suitable habitat within the park needs to be done to check for additional locations of some of the more sporadically occurring rare taxa, as they could have been missed even in some inspected areas during this survey because of the reconnaissance nature of the project. These would include taxa such as *Barbarea orthoceras*, *Botrychium simplex*, *Carex capitata*, *Danthonia spicata*, *Lycopodiella inundata* and *Potentilla multifida*. Known locations of *Viola* cf. *pallens* within the park should be revisited earlier in the growing season (when plants are still in bloom) to allow for proper species identification.

Many of the rare vascular plant taxa found within FGWPP have known occurrences outside the park boundaries. Our knowledge about these occurrences (especially on population size) is often limited, because many of them are based on historic reports or old voucher specimens (generally older than 20 years). These historically known occurrences need to be revisited to more accurately estimate the provincial significance of the occurrences found within FGWPP. In addition, some focused genetic studies may be needed to determine whether the populations of some rare plant taxa growing within FGWPP are genetically different from populations of the same species outside the study area.

Study limitations

Target areas were accessed only on foot or by boat, which significantly limited the authors' ability to cover extensive areas of the park and reach most of the remote sites. The lead author of this report spent only ten working days on the focused rare plant survey within FGWPP. The co-authors Lorna Allen and Derek Johnson focused their work on the significant small patch communities and on rare non-vascular plants and lichens, respectively. Their encounters with rare vascular plant taxa were of somewhat incidental nature so their time-share for finding rare vascular plant taxa would be hard to estimate. A few additional locations of rare vascular plants were reported by other crewmembers of the biophysical inventory team.

Because of time and logistical constraints, vast areas of the park that potentially harbour rare vascular plant taxa remain unsurveyed (mainly the inland portion of the site), and some rare taxa may have been missed even within the surveyed areas. Also, some vascular plants do not show up every year, therefore somewhat different results could be obtained if a similar study was conducted in another year. There may also be some spring flowering taxa that were missed during the survey in July. Finally, only limited time was available for documenting the actual size of each sub-population and the area of occupancy for each rare taxa encountered.

CONCLUSION

This study focused on documenting location, habitat and population size information for tracked vascular plant taxa occurring within Fidler-Greywillow Wildland Provincial Park and on updating the vascular plant species list for FGWPP. It resulted in the addition of 120 vascular plant taxa to the original list of 227 taxa for FGWPP. Twenty-eight (28) (possibly 29) vascular plant taxa that are on the 2002 Vascular Plant Tracking List and three from the 2002 Watch List were recorded during this survey. Fourteen (14) rare taxa have not been reported previously from this park and one of them is a new addition to the flora of Alberta.

This study shows that Fidler-Greywillow WPP is a highly significant site for a number of reasons:

- it supports populations of at least 28 provincially rare vascular plant taxa;
- it supports the largest known populations within the province for some of the rare taxa;
- it supports some populations that appear to be of a disjunct nature with the potential to be genetically different from populations of the same species elsewhere in the province; and
- it supports the only known location in the province for at least three vascular plant taxa;

In addition to supporting a number of provincially rare vascular plant taxa, this site provides habitat to roughly 20% of all native vascular plant taxa in the province. Future management plans should ensure that the site's special features (including provincially rare vascular plants) and its overall biodiversity are maintained.

ACKNOWLEDGEMENTS

Thanks to Bill Richards and Erin Flynn for their assistance during fieldwork, and to Ted Johnson and all those other members of the field team who contributed information and species locations. Many thanks go to Joyce Gould, ANHIC senior botanist, for providing her comments on the draft version of this document.

REFERENCES CITED

Achuff, P. 1994. Natural Regions and Subregions of Alberta: a revised classification for protected areas management. Alberta Tourism, Parks and Recreation, Edmonton, AB.

Allen, L. 2004. Alberta Natural Heritage Information Centre preliminary plant community tracking list. Alberta Community Development, Edmonton, AB.

Allen, L., D. Hunter, W. Nordstrom, and D. Vujnovic. 2003a. Maybelle River Wildland Provincial Park and Athabasca Dunes Ecological Reserve – A Synthesis of Biophysical Information. A report prepared for Parks and Protected Areas Division, Alberta Community Development, Edmonton, AB.

Allen, L., J. D. Johnson, and K. Vujnovic. 2003b. Small Patch Communities of Fidler-Greywillow Wildland Provincial Park. A report prepared for Parks and Protected Areas, Alberta Community Development, Edmonton, AB.

ANHIC. 2001. Database query (database accessed in May 2001).

ANHIC (Alberta Natural Heritage Information Centre). 2003. Database (accessed in period October-November 2003).

BC CDC (British Columbia Conservation Data Centre). 2003. BC Species and Ecosystem Explorer. URL http://srmapps.gov.bc.ca/apps/eswp/search.do?searchType=PLANT (searched in November 2003).

Cody, W. J. and D. M. Britton. 1989. Ferns and Fern Allies of Canada. Research Branch, Agriculture Canada, Publication 1829/E. Ottawa, ON.

Douglas G.W., G.W. Argus, H.L. Dickson, and D.F. Brunton. 1981. The rare vascular plants of the Yukon. Syllogeus No. 28. National Museum of Natural Sciences, Ottawa, ON.

Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar (eds). 1998a. Illustrated flora of British Columbia. Volume 1: Gymnosperms and Dicotyledons (Aceraceae through Asteraceae). Ministry of Environment, Lands and Parks, and Ministry of Forests, Victoria, BC.

Douglas, G.W., G.B. Straley, D. Meidinger and J. Pojar (eds). 1998b. Illustrated flora of British Columbia Volume 2: Dicotyledons (Balsaminaceae through Cuscutaceae). Ministry of Environment, Lands and Parks, and Ministry of Forests, Victoria, BC.

Douglas, G.W., D. Meidinger, and J. Pojar(eds). 1999. Illustrated flora of British Columbia Volume 3: Dicotyledons (Diapensiaceae through Onagraceae). Ministry of Environment, Lands and Parks, and Ministry of Forests, Victoria, BC.

Douglas, G.W., D. Meidinger, and J. Pojar eds). 2000. Illustrated Flora of British Columbia. Volume 5. Dicotyledons (Salicaceae through Zygophyllaceae) and Pteridophytes. Ministry of Environment, Lands and Parks, and Ministry of Forests, Victoria, BC.

Douglas, G.W., D. Meidinger, and J. Pojar (eds). 2001a. Illustrated flora of British Columbia, Volume 6: Monocotyledons (Acoraceae through Najadaceae). Ministry of Environment, Lands and Parks and Ministry of Forests. Victoria, BC.

Douglas, G.W., D. Meidinger, and J. Pojar (eds). 2001b. Illustrated flora of British Columbia Volume 7: Monocotyledons (Orchidaceae through Zosteraceae). Ministry of Environment, Lands and Parks, and Ministry of Forests, Victoria, BC.

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia. Second Edition. Province of British Columbia, Victoria, BC.

Ealey, D. 1993. Alberta plants and fungi – master species list and species group checklists. Alberta Environmental Protection, Edmonton, AB.

Fairbarns, M., P. Lee, and C.W. Wallis. 1984. Notes from field work in the Fidler Point area. Files of Parks and Protected Areas, Alberta Community Development, Edmonton, AB.

Flora of North America Editorial Committee (eds.) (FNA). 1993. Flora of North America North of Mexico, Vol. 2. Pteridophytes and Gymnosperms. Oxford University Press, NY

Flora of North America Editorial Committee (eds.) (FNA). 2000. Flora of North America North of Mexico, Vol 22: Magnoliophyta: Alismatidae, Arecidae, Commelinidae (in part), and Zingiberidae. Oxford University Press, NY

Flora of North America Editorial Committee (eds.) (FNA). 2002. Flora of North America North of Mexico, Vol 23: Magnoliophyta: Commelinidae (in part): Cyperaceae. Oxford University Press, NY

Green, R., G.B. Mellon, and M.A. Carrigy. 1970. Bedrock geology of northern Alberta, NTS 84 and NTS 74D, 74E, 74L and 74M. Map 024, Alberta Geological Survey Reports.

Griffiths, G.C.D. 1989. The true *Carex rostrata* (Cyperaceae) in Alberta. Alberta Naturalist 19(3): 105-108.

Johnson, D, L. Kershaw, A. MacKinnon, and J. Pojar. 1995. Plants of the western boreal forest and aspen parkland. Lone Pine Publishing and the Canadian Forest Service, Edmonton, AB.

Kartesz, J.T. 1994. A synonymized checklist of the vascular flora of the U.S., Canada, and Greenland. 2nd edition. 2 vols. Timber Press, Portland, OR.

Kartesz, J.T. 1999. A Synonymized Checklist and Atlas with Biological Attributes for the Vascular Flora of the United States, Canada, and Greenland. First Edition. In: Kartesz, J.T., and C.A. Meacham. Synthesis of the North American Flora, Version 1.0. North Carolina Botanical Garden, Chapel Hill, NC.

Kershaw, L., J. Gould, D. Johnson, and J. Lancaster (eds). 2001. Rare vascular plants of Alberta. The University of Alberta Press and the Canadian Forest Service, Edmonton, AB.

Master, L. L., B. A. Stein, L. S. Kutner, and G. A. Hammerson. 2000. Vanishing assets: conservation status of U.S. species. Pages 93-118 in B. A. Stein, L. S. Kutner, and J. S. Adams, editors. Precious heritage: the status of biodiversity in the United States. Oxford University Press, New York, NY.

McJannet, L. C., G. W. Argus, and W. J. Cody. 1995. Rare vascular plants in the Northwest Territories. Syllogeus No. 73. Canadian Museum of Nature, Ottawa, ON.

Mittermeier R.A. and A. B. Forsyth. 1994. Setting priorities for biodiversity conservation: one organization's approach. Pages 125-140 in G. K. Meffe and C. R. Carroll, editors. Principles of Conservation Biology. Sinauer and Associates, Sunderland, MA.

Moss, E. H. 1983. Flora of Alberta (2nd edition). Revised by J.G. Packer. University of Toronto Press, Toronto, ON.

NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.8 (1 July 2003). Arlington, Virginia, USA [available on-line at http://www.natureserve.org/explorer].

NatureServe. 2004a. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.0 (01 July 2004. Arlington, Virginia, USA [available on-line at http://www.natureserve.org/explorer/ranking.htm#assessment].

NatureServe. 2004b. NatureServe: Product& Services. Natural Heritage Methodology: Supporting Interoperability within the NatureServe Network. Arlington, Virginia, USA [available on-line at http://www.natureserve.org/prodServices/heritagemethodology].

Parks and Protected Areas. 2004. A Spectrum of Sites: Alberta's Parks and Protected Areas Site Classifications. [http://www.cd.gov.ab.ca/preserving/parks/managing/spectrumsites.asp#wildland].

Raup, H. M. 1928. A survey of the vegetation of Shelter Point, Athabasca Lake. Ph.D. Thesis, University of Pittsburgh, Pittsburgh, Pennsylvania. 53 pp.

Raup, H. M. 1936. Phytogeographic studies in the Athabasca-Great Slave Lake Region I. Catalogue of the Vascular Plants. Journal of the Arnold Arboretum 17: 180–315.

Raup, H. M. 1946. Phytogeographic studies in the Athabasca-Great Slave Lake Region II. Journal of the Arnold Arboretum 27: 1–85.

Scoggan, 1978-79. The Flora of Canada. Volumes 1 – 4. National Museum of Natural Sciences, National Museum of Canada, Ottawa, ON.

Vander Kloet, S.P. 1988. The genus *Vaccinium* in North America. Agricultiure Canada, Research Branch, Ottawa, ON.

Vujnovic, K. and J. Gould. 2002. Alberta Natural Heritage Information Centre Tracking and Watch Lists – Vascular Plants, Mosses, Liverworts and Hornworts. Alberta Community Development, Parks and Protected Areas Division, Edmonton, Alberta. [available on-line at http://www.cd.gov.ab.ca/preserving/parks/anhic/docs/plants_2002.pdf]

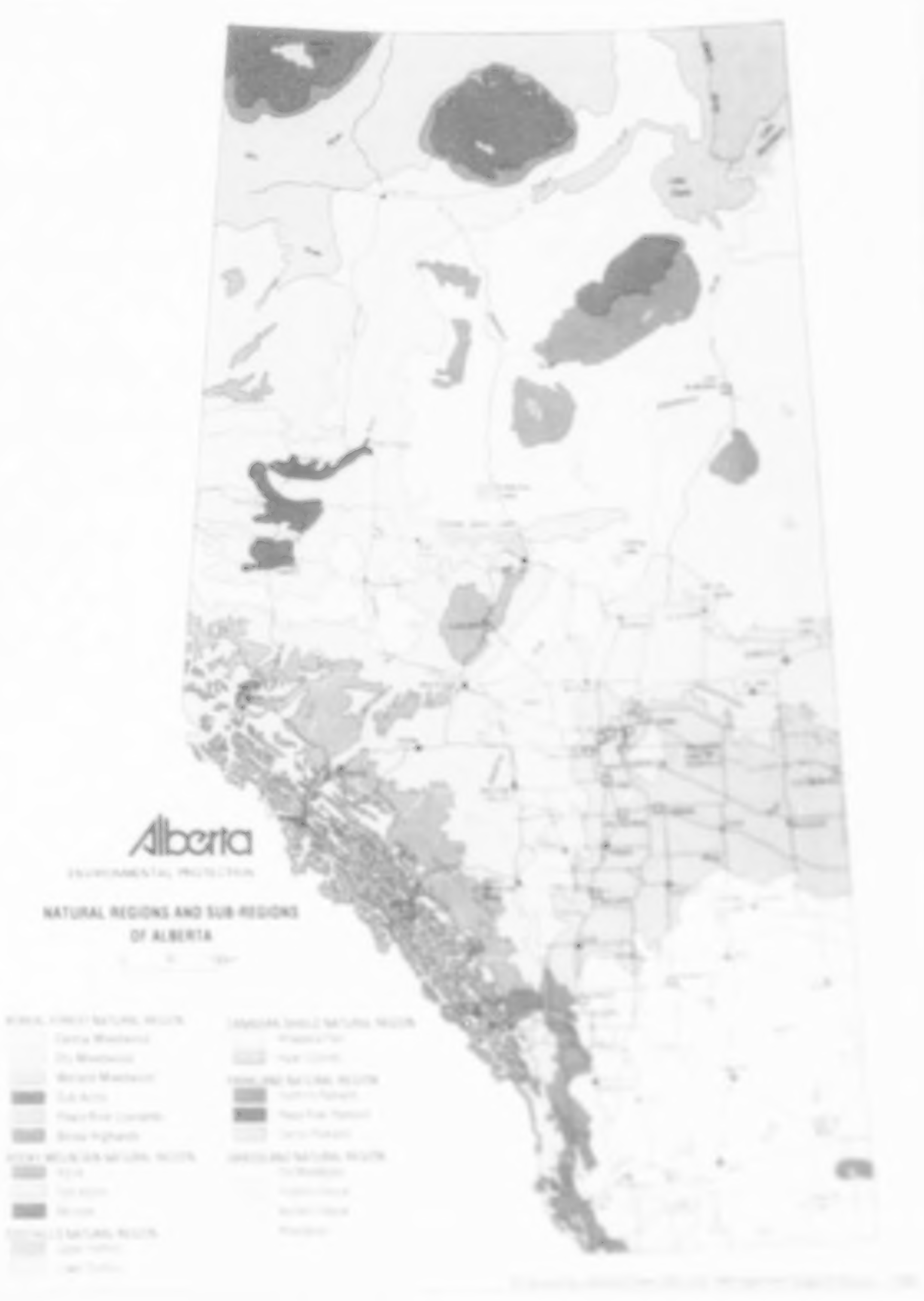
Wallis, C.W. and C. Wershler. 1984. Kazan Upland resource assessment for ecological reserves planning in Alberta. Alberta Energy and Natural Resources, Edmonton, AB.

Personal Communications:

Britton, D.M. – Dept. of Molecular Biology and Genetics, University of Guelph, Guelph, ON.

Gould, A.J. – Senior botanist, ANHIC, Parks and Protected Areas Division, Alberta Community Development, Edmonton, AB.

APPENDIX 1 – Map of Natural Regions and Subregions of Alberta.


Alberta
ENVIRONMENTAL PROTECTION
NATURAL REGIONS AND SUB-REGIONS OF ALBERTA
BOREAL FOREST NATURAL REGION
Central Mixedwood
Dry Mixedwood
Wetland Mixedwood
Sub-Arctic
Peace River Lowlands
Boreal Highlands
ROCKY MOUNTAIN NATURAL REGION
Alpine
Subalpine
Montane
FOOTHILLS NATURAL REGION
Upper Foothills
Lower Foothills
CANADIAN SHIELD NATURAL REGION
Athabasca Plain
Kazan Upland
PARKLAND NATURAL REGION
Foothills Parkland
Peace River Parkland
Central Parkland
GRASSLAND NATURAL REGION
Dry Mixedgrass
Foothills Fescue
Northern Fescue
Mixedgrass

[illegible]

APPENDIX 1 – Map of Natural Regions and Subregions of Alberta.

Alberta
ENVIRONMENTAL PROTECTION
NATURAL REGIONS AND SUB-REGIONS
OF ALBERTA

APPENDIX 2 – Vascular Plants of Fidler-Greywillow Wildland Provincial Park

Complete list of vascular plant species found within Fidler-Greywillow Wildland Provincial Park (includes species reported in Fairbarns et al. 1984 (~) and those collected (#) or just noted (*) during 2001 fieldwork; species on Tracking and Watch Lists with grey fill); herbaria where specimens of the rare and watched taxa collected in 2001 are deposited are indicated in square brackets along with associated accession numbers (ALTA=University of Alberta; CAFB= Northern Forestry Centre, Canadian Forest Service; PP=Parks and Protected Areas).

Scientific name	Common name
Club Moss Family (Lycopodiaceae)	
*Diphasiastrum (Lycopodium) complanatum~**	ground-cedar
Huperzia (Lycopodium) selago~# [CAFB: Acc. No. 980387]	mountain club-moss
Lycopodiella inundata (Lycopodium inundatum)~# [PP: Acc. No. 4453]	bog club-moss
*Lycopodium annotinum~**	stiff club-moss
*Lycopodium clavatum**	running club-moss
*Lycopodium obscurum~**	ground-pine
Little Club-moss Family (Selaginellaceae)	
Selaginella rupestris#	rock little club-moss
Quillwort Family (Isoetaceae)	
Isoetes echinospora# [PP: Acc. No. 4483]	northern quillwort
Horsetail Family (Equisetaceae)	
Equisetum arvense~#	common horsetail
*Equisetum fluviatile~**	swamp horsetail
*Equisetum palustre**	marsh horsetail
*Equisetum scirpoides**	dwarf scouring-rush
*Equisetum sylvaticum~**	woodland horsetail
Equisetum variegatum#	variegated horsetail
Adder's-tongue Family (Ophioglossaceae)	
Botrychium simplex# [ALTA: Acc. No. 109574]	dwarf grape fern
Wood Fern Family (Dryopteridaceae)	
*Cryptogramma acrostichoides~**	parsley fern
Cystopteris fragilis~#	fragile bladder fern
Dryopteris carthusiana#	narrow spinulose shield fern
Dryopteris fragrans~# [ALTA: Acc. No. 109576 ; PP: Acc. #4774]	fragrant shield fern
Gymnocarpium dryopteris~#	oak fern
Gymnocarpium jessoense subsp. *parvulum#* [ALTA: Acc.No. 109579]	northern oak fern
Woodsia ilvensis~# [ALTA: Acc. No. 109580; PP: Acc. No. 4825]	rusty woodsia
Woodsia oregana~	Oregon woodsia
Fern Family (Polypodiaceae)	
Polypodium sibiricum~# [ALTA: Acc. No. 109578, 109577; PP: Acc. No. 4805; 4832, 4783, 4817, 4846]	rock polypody

APPENDIX 2 – Vascular Plants of Fidler-Greywillow Wildland Provincial Park

Complete list of vascular plant species found within Fidler-Greywillow Wildland Provincial Park (includes species reported in Fairbarns et al. 1984 (~) and those collected (#) or just noted (*) during 2001 fieldwork; species on Tracking and Watch Lists with grey fill); herbaria where specimens of the rare and watched taxa collected in 2001 are deposited are indicated in square brackets along with associated accession numbers (ALTA=University of Alberta; CAFB= Northern Forestry Centre, Canadian Forest Service; PP=Parks and Protected Areas).

Scientific name	Common name
Club Moss Family (Lycopodiaceae)	
*Diphasiastrum (Lycopodium) complanatum~**	ground-cedar
Huperzia (Lycopodium) selago~# [CAFB: Acc. No. 980387]	**mountain club-moss**
Lycopodiella inundata (Lycopodium inundatum)~# [PP: Acc. No. 4453]	**bog club-moss**
*Lycopodium annotinum~**	stiff club-moss
*Lycopodium clavatum**	running club-moss
*Lycopodium obscurum~**	ground-pine
Little Club-moss Family (Selaginellaceae)	
Selaginella rupestris#	rock little club-moss
Quillwort Family (Isoetaceae)	
Isoetes echinospora# [PP: Acc. No. 4483]	**northern quillwort**
Horsetail Family (Equisetaceae)	
Equisetum arvense~#	common horsetail
*Equisetum fluviatile~**	swamp horsetail
*Equisetum palustre**	marsh horsetail
*Equisetum scirpoides**	dwarf scouring-rush
*Equisetum sylvaticum~**	woodland horsetail
Equisetum variegatum#	variegated horsetail
Adder's-tongue Family (Ophioglossaceae)	
Botrychium simplex# [ALTA: Acc. No. 109574]	**dwarf grape fern**
Wood Fern Family (Dryopteridaceae)	
*Cryptogramma acrostichoides~**	parsley fern
Cystopteris fragilis~#	fragile bladder fern
Dryopteris carthusiana#	narrow spinulose shield fern
Dryopteris fragrans~# [ALTA: Acc. No. 109576 ; PP: Acc. #4774]	**fragrant shield fern**
Gymnocarpium dryopteris~#	oak fern
Gymnocarpium jessoense* subsp. *parvulum# [ALTA: Acc.No. 109579]	**northern oak fern**
Woodsia ilvensis~# [ALTA: Acc. No. 109580; PP: Acc. No. 4825]	**rusty woodsia**
Woodsia oregana~	Oregon woodsia
Fern Family (Polypodiaceae)	
Polypodium sibiricum~# [ALTA: Acc. No. 109578, 109577; PP: Acc. No. 4805; 4832, 4783, 4817, 4846]	**rock polypody**

Scientific name	Common name
Pine Family (Pinaceae)	
*Larix laricina~**	tamarack
*Picea glauca~**	white spruce
*Picea mariana~**	black spruce
*Pinus banksiana~**	jack pine
Cypress Family (Cupressaceae)	
*Juniperus communis~**	ground juniper
Juniperus horizontalis~	creeping juniper
Cattail Family (Typhaceae)	
*Typha latifolia~**	common cattail
Bur-Reed Family (Sparganiaceae)	
Sparganium angustifolium#	narrow-leaved bur-reed
Sparganium eurycarpum~#	giant bur-reed
Sparganium minimum~#	slender bur-reed
Scheuchzeria Family (Scheuchzeriaceae)	
Scheuchzeria palustris~#	scheuchzeria
Pondweed Family (Potamogetonaceae)	
Potamogeton alpinus~#	alpine pondweed
Potamogeton gramineus~#	various-leaved pondweed
Potamogeton pusillus#	small-leaf pondweed
*Potamogeton richardsonii~**	clasping-leaf pondweed
Arrow-Grass Family (Juncaginaceae)	
*Triglochin maritima**	arrow grass
*Triglochin palustris~**	slender arrow grass
Water-Plantain Family (Alismataceae)	
Alisma plantago-aquatica~#	broad-leaved water-plantain
*Sagittaria cuneata~**	arum-leaved arrowhead
Grass Family (Poaceae/Gramineae)	
Agrostis scabra~#	rough hair grass
Alopecurus aequalis~#	short-awned foxtail
*Beckmannia syzigachne~**	slough grass
Bromus sp.~	brome
Bromus ciliatus#	fringed brome
Bromus inermis~	awnless brome
Bromus inermis ssp. *pumpellianus#*	awnless brome
Calamagrostis canadensis~#	bluejoint/marsh reed grass
Calamagrostis inexpansa~#	Northern reed grass
Calamagrostis purpurascens#	purple reed grass

Scientific name	Common name
Calamagrostis stricta#	narrow reed grass
Danthonia spicata# [ALTA: Acc. No. 109601; PP: Acc. No. 4473, 4830]	**poverty oat grass**
Deschampsia cespitosa#	tufted hair grass
*Elymus innovatus**	hairy wild rye
*Elymus trachycaulus (Agropyron trachycaulum)~**	slender wheat grass
Festuca rubra~#	red fescue
Festuca rubra ssp. *arctica#*	red fescue
Festuca saximontana~#	northern rough fescue
*Glyceria borealis~**	northern manna grass
*Glyceria grandis~**	common manna grass
*Glyceria striata~**	fowl manna grass
*Hierochloe odorata~**	sweet grass
Leymus (Elymus) mollis~*	**American dune grass**
*Oryzopsis pungens~**	northern rice grass
Phalaris arundinacea~	reed canary grass
*Phragmites australis~**	common reed grass
Poa ?arida#	plains bluegrass
Poa glauca#	timberline bluegrass
*Poa interior**	inland bluegrass
*Poa pratensis**	Kentucky bluegrass
*Poa palustris**	fowl bluegrass
Puccinellia distans* ssp. *hauptiana# [ALTA; Acc. No. 109566]	**Haupt's salt-meadow grass**
Puccinellia nuttalliana#	Nuttall's salt-meadow grass
Schizachne purpurascens~#	purple oat grass
Trisetum spicatum~#	spike trisetum
Vahlodea atropurpurea~	mountain hair grass
Sedge Family (Cyperaceae)	
Carex aenea~	silvery-flowered sedge
Carex aquatilis~	water sedge
Carex aquatilis var. *aquatilis#*	water sedge
Carex aquatilis var. *stans#*	water sedge
*Carex aurea**	golden sedge
Carex arcta~	narrow sedge
Carex atherodes#	awned sedge
Carex brunnescens~#	brownish sedge
*Carex buxbaumii**	brown sedge
*Carex capillaris**	hair-like sedge
Carex capitata~*	**capitate sedge**
Carex chordorrhiza~#	prostrate sedge
*Carex concinna**	beautiful sedge
Carex crawfordii~#	Crawford's sedge
Carex curta~#	short sedge
Carex deflexa~#	bent sedge
Carex diandra#	two-stamened sedge
*Carex disperma~**	two-seeded sedge
Carex echinata* ssp. *echinata# [ALTA: Acc. No. 109558, 109559, 109560; CAFB: Acc. No. 980434]	**little prickly sedge**
*Carex gynocrates**	northern/yellow bog sedge
*Carex lasiocarpa~**	hairy-fruited/slender sedge
Carex lenticularis~	lens-fruited sedge
Carex lenticularis* var. *dolia# [ALTA: Acc. No. 109589]	**lens-fruited sedge**
Carex lenticularis* var. *lenticularis# [ALTA: Acc. No. 109588]	
Carex lenticularis var. *lipocarpa#*	Kellogg's sedge

Scientific name	Common name
*Carex leptalea~**	bristle-stalked sedge
Carex limosa~#	mud/shore sedge
*Carex livida**	livid sedge
Carex loliacea~#	rye-grass sedge
*Carex norvegica~**	Norway sedge
Carex obtusata~	blunt sedge
Carex oligosperma~# [CAFB: Acc. No. 980355]	**few-fruited sedge**
*Carex pauciflora~**	few-flowered sedge
*Carex paupercula**	bog sedge
Carex rossii~#	Ross' sedge
Carex rostrata~# [PP: Acc. No. 4467, 4826]	**beaked sedge**
*Carex sartwellii**	Sartwell's sedge
Carex saxatilis~#	rocky-ground sedge
Carex siccata~#	hay sedge
Carex supina#* [PP: Acc. No. 4564]	**weak sedge**
Carex tenuiflora#	thin-flowered sedge
Carex umbellata# [ALTA: Acc. No. 109594, 109595; PP: Acc. No. 4804, 4816, 4821, 4859]	**umbellate sedge**
Carex utriculata#	sheathed sedge
*Carex vaginata**	sheathed sedge
*Carex viridula~**	green sedge
*Eleocharis acicularis~**	needle spike-rush
Eleocharis palustris#	creeping spike-rush
Eleocharis quinqueflora~	few-flowered spike-rush
*Eriophorum brachyantherum~**	close-sheathed cotton grass
*Eriophorum chamissonis~**	russett cotton grass
*Eriophorum gracile~**	slender cotton grass
Eriophorum polystachion#	tall cotton grass
*Eriophorum vaginatum~**	sheathed cotton grass
*Eriophorum viridi-carinatum**	thin-leaved cotton grass
Rhynchospora capillacea# [ALTA; Acc. No. 109567, 109568]	**slender beak-rush**
*Scirpus cespitosus~**	tufted bulrush
Scirpus cyperinus~#	wool-grass
*Scirpus hudsonianus~**	Hudson bay bulrush
*Scirpus microcarpus~**	small fruited bulrush
*Scirpus validus~**	common great bulrush
Arum Family (Araceae)	
*Calla palustris~**	water arum / wild calla
Rush Family (Juncaceae)	
Juncus alpinoarticulatus~#	alpine rush
Juncus balticus~#	wire rush
Juncus balticus var. *littoralis#*	wire rush
Juncus brevicaudatus~# [ALTA: Acc. No. 109596, 109597; CAFB: Acc. No. 980436; PP: Acc. No. 4456, 4470, 4471, 4477]	**short-tailed rush**
Juncus bufonius~#	toad rush
Juncus filiformis~# [PP: Acc. No. 4475, 4457; ALTA: Acc. No. 109778]	**thread rush**
Juncus nodosus~#	knotted rush
Juncus stygius# [ALTA: Acc. No. 109599, 109598]	**marsh rush**
Juncus tenuis var. *dudleyi#*	slender rush
Juncus vaseyi~#	big-headed rush
Luzula groenlandica~# [ALTA: Acc. No. 109564; CAFB: Acc. No. 980371]	**wood-rush**

Scientific name	Common name
Calamagrostis stricta#	narrow reed grass
Danthonia spicata# [ALTA: Acc. No. 109601; PP: Acc. No. 4473, 4830]	**poverty oat grass**
Deschampsia cespitosa#	tufted hair grass
_Elymus innovatus_*	hairy wild rye
Elymus trachycaulus (Agropyron trachycaulum)~*	slender wheat grass
Festuca rubra~#	red fescue
Festuca rubra ssp. _arctica_#	red fescue
Festuca saximontana~#	northern rough fescue
Glyceria borealis~*	northern manna grass
Glyceria grandis~*	common manna grass
Glyceria striata~*	fowl manna grass
Hierochloe odorata~*	sweet grass
Leymus (Elymus) mollis~*	**American dune grass**
Oryzopsis pungens~*	northern rice grass
Phalaris arundinacea~	reed canary grass
Phragmites australis~*	common reed grass
Poa ?arida#	plains bluegrass
Poa glauca#	timberline bluegrass
_Poa interior_*	inland bluegrass
_Poa pratensis_*	Kentucky bluegrass
_Poa palustris_*	fowl bluegrass
Puccinellia distans ssp. _hauptiana_# [ALTA: Acc. No. 109566]	**Haupt's salt-meadow grass**
Puccinellia nuttalliana#	Nuttall's salt-meadow grass
Schizachne purpurascens~#	purple oat grass
Trisetum spicatum~#	spike trisetum
Vahlodea atropurpurea~	mountain hair grass
Sedge Family (Cyperaceae)	
Carex aenea~	silvery-flowered sedge
Carex aquatilis~	water sedge
Carex aquatilis var. _aquatilis_#	water sedge
Carex aquatilis var. _stans_#	water sedge
_Carex aurea_*	golden sedge
Carex arcta~	narrow sedge
Carex atherodes#	awned sedge
Carex brunnescens~#	brownish sedge
_Carex buxbaumii_*	brown sedge
_Carex capillaris_*	hair-like sedge
Carex capitata~*	**capitate sedge**
Carex chordorrhiza~#	prostrate sedge
_Carex concinna_*	beautiful sedge
Carex crawfordii~#	Crawford's sedge
Carex curta~#	short sedge
Carex deflexa~#	bent sedge
Carex diandra#	two-stamened sedge
Carex disperma~*	two-seeded sedge
Carex echinata ssp. _echinata_# [ALTA: Acc. No. 109558, 109559, 109560; CAFB: Acc. No. 980434]	**little prickly sedge**
_Carex gynocrates_*	northern/yellow bog sedge
Carex lasiocarpa~*	hairy-fruited/slender sedge
Carex lenticularis~	lens-fruited sedge
Carex lenticularis var. _dolia_# [ALTA: Acc. No. 109589]	**lens-fruited sedge**
Carex lenticularis var. _lenticularis_# [ALTA: Acc. No. 109588]	
Carex lenticularis var. _lipocarpa_#	Kellogg's sedge

Scientific name	Common name
*Carex leptalea~**	bristle-stalked sedge
Carex limosa~#	mud/shore sedge
*Carex livida**	livid sedge
Carex loliacea~#	rye-grass sedge
*Carex norvegica~**	Norway sedge
Carex obtusata~	blunt sedge
Carex oligosperma~# [CAFB: Acc. No. 980355]	**few-fruited sedge**
*Carex pauciflora~**	few-flowered sedge
*Carex paupercula**	bog sedge
Carex rossii~#	Ross' sedge
Carex rostrata~# [PP: Acc. No. 4467, 4826]	**beaked sedge**
*Carex sartwellii**	Sartwell's sedge
Carex saxatilis~#	rocky-ground sedge
Carex siccata~#	hay sedge
Carex supina#* [PP: Acc. No. 4564]	**weak sedge**
Carex tenuiflora#	thin-flowered sedge
Carex umbellata# [ALTA: Acc. No. 109594, 109595; PP: Acc. No. 4804, 4816, 4821, 4859]	**umbellate sedge**
Carex utriculata#	sheathed sedge
*Carex vaginata**	sheathed sedge
*Carex viridula~**	green sedge
*Eleocharis acicularis~**	needle spike-rush
Eleocharis palustris#	creeping spike-rush
Eleocharis quinqueflora~	few-flowered spike-rush
*Eriophorum brachyantherum~**	close-sheathed cotton grass
*Eriophorum chamissonis~**	russett cotton grass
*Eriophorum gracile~**	slender cotton grass
Eriophorum polystachion#	tall cotton grass
*Eriophorum vaginatum~**	sheathed cotton grass
*Eriophorum viridi-carinatum**	thin-leaved cotton grass
Rhynchospora capillacea# [ALTA: Acc. No. 109567, 109568]	**slender beak-rush**
*Scirpus cespitosus~**	tufted bulrush
Scirpus cyperinus~#	wool-grass
*Scirpus hudsonianus~**	Hudson bay bulrush
*Scirpus microcarpus~**	small fruited bulrush
*Scirpus validus~**	common great bulrush
Arum Family (Araceae)	
*Calla palustris~**	water arum / wild calla
Rush Family (Juncaceae)	
Juncus alpinoarticulatus~#	alpine rush
Juncus balticus~#	wire rush
Juncus balticus var. *littoralis#*	wire rush
Juncus brevicaudatus~# [ALTA: Acc. No. 109596, 109597; CAFB: Acc. No. 980436; PP: Acc. No. 4456, 4470, 4471, 4477]	**short-tailed rush**
Juncus bufonius~#	toad rush
Juncus filiformis~# [PP: Acc. No. 4475, 4457; ALTA: Acc. No. 109778]	**thread rush**
Juncus nodosus~#	knotted rush
Juncus stygius# [ALTA: Acc. No. 109599, 109598]	**marsh rush**
Juncus tenuis var. *dudleyi#*	slender rush
Juncus vaseyi~#	big-headed rush
Luzula groenlandica~# [ALTA: Acc. No. 109564; CAFB: Acc. No. 980371]	**wood-rush**

Scientific name	Common name
Lily Family (Liliaceae)	
*Allium schoenoprasum~**	wild chives
*Maianthemum canadense~**	wild lily-of-the-valley
*Smilacina trifolia~**	three-leaved Soloman's seal
Iris Family (Iridaceae)	
Sisyrinchium montanum~#	blue-eyed grass
Orchid Family (Orchidaceae)	
*Corallorhiza trifida**	pale coral root
Cypripedium acaule~*	**stemless lady' slipper**
*Goodyera repens~**	lesser rattlesnake plantain
*Platanthera (Habenaria) hyperborea**	northern green orchid
*Spiranthes romanzoffiana**	ladies'-tresses
Willow Family (Salicaceae)	
*Populus balsamifera**	balsam poplar
*Populus tremuloides~**	aspen
*Salix bebbiana**	Bebb's / beaked willow
Salix brachycarpa var. *brachycarpa#*	short-capsuled willow
Salix exigua#	sandbar willow
*Salix glauca~**	smooth willow
Salix lucida ssp. *lasiandra**	shining willow
*Salix lutea~**	yellow willow
*Salix pedicellaris~**	bog willow
Salix petiolaris~	basket willow
Salix planifolia~#	flat-leaved willow
*Salix pseudomonticola~**	false mountain willow
Salix pyrifolia~#	balsam willow
Salix scouleriana~#	Scouler's willow
*Salix serissima~**	autumn willow
Myricaceae	
*Myrica gale~**	sweet gale
Birch Family (Betulaceae)	
*Alnus crispa~**	green alder
*Alnus tenuifolia~**	river alder
*Betula papyrifera~**	white birch
Betula pumila~#	dwarf birch
Betula X uliginosa#	dwarf birch hybrid
Sandalwood Family (Santalaceae)	
*Geocaulon lividum~**	bastard toad flax
Mistletoe Family (Loranthaceae)	
*Arceuthobium americanum**	dwarf mistletoe

Scientific name	Common name
Buckwheat Family (Polygonaceae)	
*Polygonum amphibium~**	water smartweed
Polygonum arenastrum#	common knotweed
*Polygonum coccineum**	water smartweed
Polygonum erectum~	striate knotweed
Polygonum lapathifolium#	pale persicaria
Polygonum ramosissimum~	bushy knotweed
Rumex triangulivalvis~#	narrow-leaved dock
Rumex maritimus ssp. *fueginus#*	golden dock
*Rumex crispus**	curled dock
Pink Family (Caryophyllaceae)	
*Cerastium arvense**	mouse-ear chickweed
Minuartia rubella~	red-seeded sandwort
Moehringia lateriflora~	blunt-leaved sandwort
Sagina nodosa~# [PP: Acc. No. 4482]	**pearlwort**
*Stellaria calycantha**	northern stitchwort
Stellaria longifolia~	long-leaved chickweed
Stellaria longipes~#	long-stalked chickweed
Water-Lily Family (Nymphaeaceae)	
*Nuphar (variegatum) lutea~**	yellow pond-lily
Crowfoot Family (Ranunculaceae)	
*Anemone canadensis**	Canada anemone
Caltha natans~	marsh marigold
*Ranunculus aquatilis**	white water crowfoot
*Ranunculus gmelinii**	yellow water crowfoot
*Ranunculus lapponicus**	lapland buttercup
*Ranunculus macounii**	Macoun's buttercup
Ranunculus pedatifidus~#	northern buttercup
Ranunculus pensylvanicus~	bristly buttercup
*Ranunculus reptans~**	creeping spearwort
Ranunculus sceleratus~	celery-leaved buttercup
Fumitory Family (Fumariaceae)	
*Corydalis aurea**	golden corydalis
*Corydalis sempervirens~**	pink corydalis
Mustard Family (Brassicaceae/Cruciferae)	
Arabis divaricarpa#	purple rock cress
Arabis lyrata~#	lyre-leaved rock cress
Barbarea orthoceras~# [PP: Acc. No. 4481]	**winter cress**
Cardamine pensylvanica~	bitter cress
*Rorippa palustris~**	marsh yellow cress

Scientific name	Common name
Lily Family (Liliaceae)	
Allium schoenoprasum~*	wild chives
Maianthemum canadense~*	wild lily-of-the-valley
Smilacina trifolia~*	three-leaved Soloman's seal
Iris Family (Iridaceae)	
Sisyrinchium montanum~#	blue-eyed grass
Orchid Family (Orchidaceae)	
*Corallorhiza trifida**	pale coral root
Cypripedium acaule~*	stemless lady' slipper
Goodyera repens~*	lesser rattlesnake plantain
*Platanthera (Habenaria) hyperborea**	northern green orchid
*Spiranthes romanzoffiana**	ladies'-tresses
Willow Family (Salicaceae)	
*Populus balsamifera**	balsam poplar
Populus tremuloides~*	aspen
*Salix bebbiana**	Bebb's / beaked willow
Salix brachycarpa var. *brachycarpa*#	short-capsuled willow
Salix exigua#	sandbar willow
Salix glauca~*	smooth willow
Salix lucida ssp. *lasiandra**	shining willow
Salix lutea~*	yellow willow
Salix pedicellaris~*	bog willow
Salix petiolaris~	basket willow
Salix planifolia~#	flat-leaved willow
Salix pseudomonticola~*	false mountain willow
Salix pyrifolia~#	balsam willow
Salix scouleriana~#	Scouler's willow
Salix serissima~*	autumn willow
Myricaceae	
Myrica gale~*	sweet gale
Birch Family (Betulaceae)	
Alnus crispa~*	green alder
Alnus tenuifolia~*	river alder
Betula papyrifera~*	white birch
Betula pumila~#	dwarf birch
Betula X uliginosa#	dwarf birch hybrid
Sandalwood Family (Santalaceae)	
Geocaulon lividum~*	bastard toad flax
Mistletoe Family (Loranthaceae)	
*Arceuthobium americanum**	dwarf mistletoe

Scientific name	Common name
Buckwheat Family (Polygonaceae)	
*Polygonum amphibium~**	water smartweed
Polygonum arenastrum#	common knotweed
*Polygonum coccineum**	water smartweed
Polygonum erectum~	striate knotweed
Polygonum lapathifolium#	pale persicaria
Polygonum ramosissimum~	bushy knotweed
Rumex triangulivalvis~#	narrow-leaved dock
Rumex maritimus ssp. *fueginus#*	golden dock
*Rumex crispus**	curled dock
Pink Family (Caryophyllaceae)	
*Cerastium arvense**	mouse-ear chickweed
Minuartia rubella~	red-seeded sandwort
Moehringia lateriflora~	blunt-leaved sandwort
Sagina nodosa~# [PP: Acc. No. 4482]	**pearlwort**
*Stellaria calycantha**	northern stitchwort
Stellaria longifolia~	long-leaved chickweed
Stellaria longipes~#	long-stalked chickweed
Water-Lily Family (Nymphaeaceae)	
*Nuphar (variegatum) lutea~**	yellow pond-lily
Crowfoot Family (Ranunculaceae)	
*Anemone canadensis**	Canada anemone
Caltha natans~	marsh marigold
*Ranunculus aquatilis**	white water crowfoot
*Ranunculus gmelinii**	yellow water crowfoot
*Ranunculus lapponicus**	lapland buttercup
*Ranunculus macounii**	Macoun's buttercup
Ranunculus pedatifidus~#	northern buttercup
Ranunculus pensylvanicus~	bristly buttercup
*Ranunculus reptans~**	creeping spearwort
Ranunculus sceleratus~	celery-leaved buttercup
Fumitory Family (Fumariaceae)	
*Corydalis aurea**	golden corydalis
*Corydalis sempervirens~**	pink corydalis
Mustard Family (Brassicaceae/Cruciferae)	
Arabis divaricarpa#	purple rock cress
Arabis lyrata~#	lyre-leaved rock cress
Barbarea orthoceras~# [PP: Acc. No. 4481]	**winter cress**
Cardamine pensylvanica~	bitter cress
*Rorippa palustris~**	marsh yellow cress

Scientific name	Common name
Sundew Family (Droseraceae)	
*Drosera anglica~**	oblong-leaved sundew
*Drosera rotundifolia~**	round-leaved sundew
Saxifrage Family (Saxifragaceae)	
*Heuchera richardsonii***	Richardson's alumroot
*Mitella nuda**	Bishop's-cap
*Saxifraga tricuspidata~**	three-toothed saxifrage
Grass-of-Parnassus Family (Parnassiaceae)	
Parnassia kotzebuei~	small grass-of-Parnassus
*Parnassia palustris~**	northern grass-of-Parnassus
Currant and Gooseberry Family (Grossulariaceae)	
*Ribes glandulosum**	skunk currant
*Ribes hudsonianum**	wild black currant
*Ribes lacustre**	bristly gooseberry
*Ribes oxyacanthoides~**	wild gooseberry
*Ribes triste**	wild red currant
Rose Family (Rosaceae)	
*Amelanchier alnifolia~**	saskatoon
Fragaria virginiana~	wild strawberry
Potentilla anserina~	silverweed
*Potentilia arguta~**	white cinquefoil
Potentilla bipinnatifida#	plains cinquefoil
Potentilla multifida~# [ALTA: Acc. No. 109604]	**branched cinquefoil**
*Potentilla norvegica~**	rough cinquefoil
*Potentilla palustris~**	marsh cinquefoil
Potentilla rivalis~	brook cinquefoil
*Potentilla tridentata~**	three-toothed cinquefoil
Prunus pensylvanica~	pin cherry
*Rosa acicularis~**	prickly rose
*Rubus arcticus~**	dwarf raspberry
*Rubus chamaemorus~**	cloudberry
*Rubus idaeus~**	wild red raspberry
Sorbus scopulina~#	mountain ash
Pea Family (Fabaceae/Leguminosae)	
*Astragalus alpinus~**	alpine milk vetch
Astragalus canadensis~	Canadian milk vetch
Astragalus cicer#	cicer milk vetch
Lathyrus ochroleucus~	cream-colored pea vine
*Trifolium repens~**	white clover
*Vicia americana**	American vetch
Geranium Family (Geraniaceae)	
*Geranium bicknellii**	Bicknell's geranium

Scientific name	Common name
Water-starwort Family (Callitrichaceae)	
*Callitriche verna~**	vernal water-starwort
Crowberry Family (Empetraceae)	
*Empetrum nigrum~**	crowberry
St John's-wort Family (Hypericaceae)	
Hypericum majus~# [PP: Acc. No. 4459, 4461, 4465]	**St John's-wort**
Waterwort Family (Elatinaceae)	
Elatine ? triandra~	**waterwort**
Rockrose Family (Cistaceae)	
*Hudsonia tomentosa~**	sand heather
Violet Family (Violaceae)	
Viola ?pallens# [PP: Acc. No. 4749, 4855]	**Macloskey's violet**
*Viola renifolia**	kidney-leaved violet
Oleaster Family (Elaeagnaceae)	
Shepherdia canadensis~	Canadian buffalo-berry
Evening Primrose Family (Onagraceae)	
Epilobium angustifolium~	common fireweed
Epilobium ciliatum~#	northern willowherb
Epilobium leptophyllum~#	narrow-leaved willowherb
*Epilobium palustre~**	marsh willowherb
Water-Milfoil Family (Haloragaceae)	
Myriophyllum spicatum ssp. *exalbescens**	water-milfoil
Mare's-tail Family (Hippuridaceae)	
*Hippuris vulgaris~**	common mare's-tail
Ginseng Family (Araliaceae)	
*Aralia nudicaulis~**	wild sarsaparilla
Carrot Family (Apiaceae/Umbelliferae)	
*Cicuta maculata**	water-hemlock
*Cicuta virosa**	narrow-leaved water-hemlock
*Sium suave~**	water parsnip

Scientific name	Common name
Sundew Family (Droseraceae)	
*Drosera anglica~**	oblong-leaved sundew
*Drosera rotundifolia~**	round-leaved sundew
Saxifrage Family (Saxifragaceae)	
*Heuchera richardsonii***	Richardson's alumroot
*Mitella nuda**	Bishop's-cap
*Saxifraga tricuspidata~**	three-toothed saxifrage
Grass-of-Parnassus Family (Parnassiaceae)	
Parnassia kotzebuei~	small grass-of-Parnassus
*Parnassia palustris~**	northern grass-of-Parnassus
Currant and Gooseberry Family (Grossulariaceae)	
*Ribes glandulosum**	skunk currant
*Ribes hudsonianum**	wild black currant
*Ribes lacustre**	bristly gooseberry
*Ribes oxyacanthoides~**	wild gooseberry
*Ribes triste**	wild red currant
Rose Family (Rosaceae)	
*Amelanchier alnifolia~**	saskatoon
Fragaria virginiana~	wild strawberry
Potentilla anserina~	silverweed
*Potentilla arguta~**	white cinquefoil
Potentilla bipinnatifida#	plains cinquefoil
Potentilla multifida~# [ALTA: Acc. No. 109604]	**branched cinquefoil**
*Potentilla norvegica~**	rough cinquefoil
*Potentilla palustris~**	marsh cinquefoil
Potentilla rivalis~	brook cinquefoil
*Potentilla tridentata~**	three-toothed cinquefoil
Prunus pensylvanica~	pin cherry
*Rosa acicularis~**	prickly rose
*Rubus arcticus~**	dwarf raspberry
*Rubus chamaemorus~**	cloudberry
*Rubus idaeus~**	wild red raspberry
Sorbus scopulina~#	mountain ash
Pea Family (Fabaceae/Leguminosae)	
*Astragalus alpinus~**	alpine milk vetch
Astragalus canadensis~	Canadian milk vetch
Astragalus cicer#	cicer milk vetch
Lathyrus ochroleucus~	cream-colored pea vine
*Trifolium repens~**	white clover
*Vicia americana**	American vetch
Geranium Family (Geraniaceae)	
*Geranium bicknellii**	Bicknell's geranium

Scientific name	Common name
Water-starwort Family (Callitrichaceae)	
Callitriche verna~*	vernal water-starwort
Crowberry Family (Empetraceae)	
Empetrum nigrum~*	crowberry
St John's-wort Family (Hypericaceae)	
Hypericum majus~# [PP: Acc. No. 4459, 4461, 4465]	St John's-wort
Waterwort Family (Elatinaceae)	
Elatine ? triandra~	waterwort
Rockrose Family (Cistaceae)	
Hudsonia tomentosa~*	sand heather
Violet Family (Violaceae)	
Viola ?pallens# [PP: Acc. No. 4749, 4855]	Macloskey's violet
Viola renifolia*	kidney-leaved violet
Oleaster Family (Elaeagnaceae)	
Shepherdia canadensis~	Canadian buffalo-berry
Evening Primrose Family (Onagraceae)	
Epilobium angustifolium~	common fireweed
Epilobium ciliatum~#	northern willowherb
Epilobium leptophyllum~#	narrow-leaved willowherb
Epilobium palustre~*	marsh willowherb
Water-Milfoil Family (Haloragaceae)	
Myriophyllum spicatum ssp. exalbescens*	water-milfoil
Mare's-tail Family (Hippuridaceae)	
Hippuris vulgaris~*	common mare's-tail
Ginseng Family (Araliaceae)	
Aralia nudicaulis~*	wild sarsaparilla
Carrot Family (Apiaceae/Umbelliferae)	
Cicuta maculata*	water-hemlock
Cicuta virosa*	narrow-leaved water-hemlock
Sium suave~*	water parsnip

Scientific name	Common name
Dogwood Family (Cornaceae)	
Cornus stolonifera*	red-osier dogwood
Cornus canadensis~*	bunchberry
Wintergreen Family (Pyrolaceae)	
Moneses uniflora~*	one-flowered wintergreen
Orthilia secunda~*	one-sided wintergreen
Pyrola asarifolia~*	common pink wintergreen
Pyrola chlorantha*	greenish-flowered wintergreen
Pyrola elliptica#	elliptic-leaved wintergreen
Pyrola minor~*	lesser wintergreen
Heath Family (Ericaceae)	
Andromeda polifolia*	bog rosemary
Arctostaphylos rubra*	alpine bearberry
Arctostaphylos uva-ursi~*	common bearberry (kinnikinnik)
Chamaedaphne calyculata~*	leather-leaf
Kalmia polifolia~*	swamp/pale laurel
Ledum groenlandicum~*	common Labrador tea
Ledum palustre~#	northern Labrador tea
Vaccinium myrtilloides~#	blueberry
Vaccinium oxycoccus (Oxycoccus microcarpus)~*	small bog cranberry
Vaccinium uliginosum~# [PP: Acc. No. 4782]	**bog bilberry**
Vaccinium vitis-idaea~*	bog cranberry
Primrose Family (Primulaceae)	
Lysimachia thyrsiflora~	tufted loosestrife
Primula mistassinica~#	dwarf Canadian primrose
Trientalis borealis~*	star-flower
Gentian Family (Gentianaceae)	
Gentianella amarella~*	felwort
Gentiana glauca~	alpine gentian
Buck-Bean Family (Menyanthaceae)	
Menyanthes trifoliata*	buck bean
Dogbane Family (Apocynaceae)	
Apocynum androsaemifolium~*	spreading dogbane
Phlox Family (Polemoniaceae)	
Collomia linearis~	narrow-leaved collomia
Mint Family (Lamiaceae/Labiatae)	
Dracocephalum parviflorum~	American dragonhead
Lycopus uniflorus#	water-horehound

Scientific name	Common name
Dogwood Family (Cornaceae)	
*Cornus stolonifera**	red-osier dogwood
*Cornus canadensis~**	bunchberry
Wintergreen Family (Pyrolaceae)	
*Moneses uniflora~**	one-flowered wintergreen
*Orthilia secunda~**	one-sided wintergreen
*Pyrola asarifolia~**	common pink wintergreen
*Pyrola chlorantha**	greenish-flowered wintergreen
Pyrola elliptica#	elliptic-leaved wintergreen
*Pyrola minor~**	lesser wintergreen
Heath Family (Ericaceae)	
*Andromeda polifolia**	bog rosemary
*Arctostaphylos rubra**	alpine bearberry
*Arctostaphylos uva-ursi~**	common bearberry (kinnikinnik)
*Chamaedaphne calyculata~**	leather-leaf
*Kalmia polifolia~**	swamp/pale laurel
*Ledum groenlandicum~**	common Labrador tea
Ledum palustre~#	northern Labrador tea
Vaccinium myrtilloides~#	blueberry
*Vaccinium oxycoccus (Oxycoccus microcarpus)~**	small bog cranberry
Vaccinium uliginosum~# [PP: Acc. No. 4782]	**bog bilberry**
*Vaccinium vitis-idaea~**	bog cranberry
Primrose Family (Primulaceae)	
Lysimachia thyrsiflora~	tufted loosestrife
Primula mistassinica~#	dwarf Canadian primrose
*Trientalis borealis~**	star-flower
Gentian Family (Gentianaceae)	
*Gentianella amarella~**	felwort
Gentiana glauca~	alpine gentian
Buck-Bean Family (Menyanthaceae)	
*Menyanthes trifoliata**	buck bean
Dogbane Family (Apocynaceae)	
*Apocynum androsaemifolium~**	spreading dogbane
Phlox Family (Polemoniaceae)	
Collomia linearis~	narrow-leaved collomia
Mint Family (Lamiaceae/Labiatae)	
Dracocephalum parviflorum~	American dragonhead
Lycopus uniflorus#	water-horehound

Scientific name	Common name
*Mentha arvensis**	wild mint
*Scutellaria galericulata**	marsh skullcap
*Stachys palustris~**	marsh hedge-nettle
Figwort Family (Scrophulariaceae)	
*Castilleja raupii~**	Indian paintbrush
Euphrasia arctica#	eyebright
*Melampyrum lineare~**	cow-wheat
*Rhinanthus minor~**	yellow rattle
Bladderwort Family (Lentibulariaceae)	
*Utricularia intermedia~**	flat-leaved bladderwort
*Utricularia minor**	small bladderwort
*Utricularia vulgaris~**	common bladderwort
Plantain Family (Plantaginaceae)	
Plantago eriopoda~	saline plantain
*Plantago major**	common plantain
Madder Family (Rubiaceae)	
*Galium boreale**	northern bedstraw
*Galium trifidum~**	small bedstraw
Honeysuckle Family (Caprifoliaceae)	
*Linnaea borealis~**	twin-flower
*Lonicera dioica**	twining honeysuckle
*Symphoricarpos albus**	snowberry
*Viburnum edule~**	low-bush cranberry
Bluebell Family (Campanulaceae)	
*Campanula rotundifolia~**	bluebell; harebell
Composite Family (Asteraceae/Compositae)	
*Achillea millefolium**	common yarrow
*Achillea sibirica~**	many-flowered yarrow
Anaphalis margaritacea#	pearly everlasting
Antennaria lanata~	woolly everlasting
Antennaria neglecta~	broad-leaved everlasting
*Antennaria parvifolia**	small-leaved everlasting
Antennaria pulcherrima~	showy everlasting
Antennaria rosea~#	rosy everlasting
Arnica angustifolia~	alpine arnica
*Arnica lonchophylla~**	spear-leaved arnica
Artemisia biennis~	biennial sagewort
*Artemisia campestris~**	plains wormwood
Aster borealis#	marsh aster
Aster ciliolatus#	Lindley's aster
*Aster puniceus**	purple-stemmed aster

Scientific name	Common name
_Bidens cernua_*	nodding beggarticks
Erigeron acris ssp. politus~#	northern daisy fleabane
Erigeron philadelphicus~*	Philadelphia fleabane
Hieracium umbellatum~*	narrow-leaved hawkweed
Petasites palmatus~*	plamate-leaved coltsfoot
Senecio congestus~#	marsh ragwort
Senecio pauperculus~#	balsam groundsel
Solidago canadensis#	Canada goldenrod
Solidago graminifolia~*	flat-topped goldenrod
Solidago spathulata~#	mountain goldenrod
Sonchus uliginosus#	smooth perennial sow-thistle
Tanacetum bipinnatum ssp. _huronense_~*	**Indian tansy**
Taraxacum sp.*	northern dandelion

** species found just outside park boundary, but not within the park

Scientific name	**Common name**
*Bidens cernua**	nodding beggarticks
Erigeron acris ssp. politus~#	northern daisy fleabane
*Erigeron philadelphicus~**	Philadelphia fleabane
*Hieracium umbellatum~**	narrow-leaved hawkweed
*Petasites palmatus~**	plamate-leaved coltsfoot
Senecio congestus~#	marsh ragwort
Senecio pauperculus~#	balsam groundsel
Solidago canadensis#	Canada goldenrod
*Solidago graminifolia~**	flat-topped goldenrod
Solidago spathulata~#	mountain goldenrod
Sonchus uliginosus#	smooth perennial sow-thistle
Tanacetum bipinnatum* ssp. *huronense~*	**Indian tansy**
Taraxacum sp.*	northern dandelion

** species found just outside park boundary, but not within the park

APENDIX 3 – List of tracked vascular plants with one or more occurrences mapped within 2.5 km of the Kazan Uplands and Athabasca Plain Natural Subregions (ANHIC 2001).

Element Scientific Name	Common Name	S and GRanks*	Habitat as described in Moss (1983)	Detailed habitat description from ANHIC files**
Barbarea orthoceras	American winter cress	S2 G5	stream banks, moist woods	moist depressions and seepages in meadows and woods (poplar, pine dominated); gravel bars on river sides; wet edges of lakes, creeks, streams and beaver ponds; sandy lake beaches
Botrychium multifidum var. intermedium	leather grape fern	S2 G5T4?	moist, sandy areas	low-lying forest close to lake shore; open shrub thicket and forb meadow; dry upland *Populus balsamifera* forest; native prairie; *Populus tremuloides* woods; sandy thickets; *Carex – Poa* meadow on coarse sands; dry sandy ground in *Pinus banksiana* woods; along trails at edge of *Picea glauca* –- *Populus tremuloides* stand and through grassy openings; willowy pool in sand dunes; moist edge of *Abies lasiocarpa – Picea engelmannii* stand
Brasenia schreberi	watershield	S1 G5	[not included]	small lakes between sand ridges
Cardamine pratensis	meadow bitter cress	S1S2 G5	moist meadows	low, wet depression in conifer woods; *Larix laricina* wetland; springy places; sheltered bay with *Equisetum fluviatile*; wobbly seepage area on lake shore; peat area
Carex capitata	capitate sedge	S2 G5	boggy, often calcareous areas	calcareous fens; willow-sedge wetlands; sloping river banks; alpine tundra and hillsides; dry *Picea mariana, Picea mariana – Pinus contorta* and *Pinus contorta* dominated forests (often on sandy grounds); in crevices of rock outcrops
Carex heleonastes	Hudson Bay sedge	S2 G4	bogs and marshes, often calcareous	shallow marsh water; fen; patterned fen; open bog; *Picea mariana/Ledum groenlandicum – Sphagnum* bog; *Menyanthes trifoliata – Carex* community; *Betula – Kalmia polifolia – Carex* fen; *Picea engelmannii/Salix* forest; valley wetland; willow meadow along creek
Carex houghtoniana	sand sedge	S2 G5	dry, sandy, or gravelly places	dry muskeg, stripped woods, gravelly; coal spoils; abandoned strip-mined land; sandhills; bare slump slope; dry, rocky clearing by edge of woods; on slope of existing reclaimed pipeline corridor seeded with introduced grasses and *Astragalus cicer*; disturbed area along airstrip; open slope in dry sandy aspen stand; moist sandy ground on burned site; reseeded right-of-way through mature subhygric *Pinus contorta – Picea mariana* forest
Carex lenticularis var. dolia	lens-fruited sedge	S1 G5T3Q	clay-gravel shores of mountain lakes (includes *C. enanderi*)	sandy shorelines; dry alpine and subalpine slopes and screes; swamps

Element Scientific Name	Common Name	S and GRanks*	Habitat as described in Moss (1983)	Detailed habitat description from ANHIC files**
Carex oligosperma	few-fruited sedge	S1 G4	wet meadows and bogs	sedge-fens; *Picea mariana* wetlands; channel fens enclosed in parabolic dune, and sedge meadow; heath-lichen areas
Carex pseudocyperus	cyperus-like sedge	S2 G5	swamps and marshes	margins of lakes and ponds; oxbow; moist clay on roadside; along railroad tracks; muskeg; sedge fen; islets in shallow portions of lake (often with *Calla palustris*); birch-alder-willow swamp in mixedwoods; alongside wet pool in stream channel
Carex rostrata *(?)*	beaked sedge	S2 G5	marshy places (includes *C. utriculata* in this publication)	Floating fens at the edge of small lakes on organic soil; poor to rich fens and string fens; thaw pockets in perched bogs of subarctic woodland; willow carrs; (often found associated with *Carex lasiocarpa*)
Carex supina	weak sedge	S1 G5	[not included]	steep, dry, southerly facing slope
Carex umbellata	umbellate sedge	S1 G5	dry open areas, often sandy (but includes *C. tonsa*)	rock outcrops; lodgepole pine woods; dry aspen stand
Danthonia spicata	poverty oat grass	S1S2 G5	dry to moist open areas and open woodland	shrubby meadow on sandy flats; dry soil in open parkland; *Populus tremuloides – Picea glauca* stand; fringes of grassy areas; dry sandy grasslands at edge of *Pinus banksiana* woods; marly-silty river banks; calcareous fen
Diphasiastrum (Lycopodium) sitchense	ground-fir	S2 G5	Open woods and barrens	coniferous forest; streamside; open heath ground in coniferous forest; mesic solifluction terrace riser; dry open area in *Picea* sp. – *Pinus contorta* forest; snow hollow behind moraine; sedge turf of *Carex nigricans – Antennaria lanata* community on moist, moderately steep slope; wetland with *Picea mariana, Chamaedaphne calyculata, Kalmia polifolia, Sphagnum fuscum*
Eupatorium maculatum	spotted Joe-pye weed	S1S2 G5	marshy ground and moist open woods	stony river bank; moist meadows on river bank; moist sandy river bank; fen meadow with grasses, sedges and scattered willows; wet organic soil of perched wetland in seepage area of river valley; wet meadows and thickets and shaded moist edge of *Picea glauca – Betula – Salix - Equisetum* community in calcareous area
Gymnocarpium jessoense	northern oak fern	S1 G5	rock crevices	shaded cliff overhanging lake
Huperzia (Lycopodium) selago *(?)*	mountain club-moss	S1 G5	alpine slopes	abandoned oil well drilling site; mesic cutline; steep wooded north slope; near small creek in aspen woods; marly lake edge; rock outcrop in *Picea glauca* woods
Hypericum majus	large Canada St. John's-wort	S2 G5	shores and marshes	moist depressions in sand dunes; drying lake beds and beaver ponds; wet shores of lakes and sinkholes; sandy lakeshores with beach cobbles; *Eleocharis* wetland
Isoetes echinospora	northern quillwort	S1 G5?	ponds and lakes	shallow water near lake shores, on sandy bottom
Juncus brevicaudatus *(?)*	short-tail rush	S2 G5	shores and marshes	wet roadside ditches; margins of open pools and ponds; on sandy lakeshores; in dune slacks

Element Scientific Name	Common Name	S and GRanks*	Habitat as described in Moss (1983)	Detailed habitat description from ANHIC files**
Juncus filiformis	thread rush	S2S3 G5	bogs and marshes	emergent vegetation at river and lake margins; roadside ditches on gravelly or till substrates; bogs and marshes; cutlines through *Populus tremuloides* – *Picea glauca* – *Pinus contorta* and *Picea mariana* – *Cladina* – feather moss stands; sink holes and small woodland pools; shrubby rich fen
Leymus (Elymus) mollis	American dune grass	S1 G5	sand-dunes	sandy lake beaches
Lobelia dortmanna	water lobelia	S1 G4	shallow water at the margin of ponds, lakes	along lake shore
Luzula groenlandica	wood-rush	S1 G4	[not included]	moist crevices on rocky shores
Lycopodiella inundata *(?)* *(Lycopodium inundatum)*	bog club-moss	S1 G5	bogs	depression in active sand dune, fen and creek sides within parabolic sand dune system
Nymphaea leibergii	pygmy water-lily	S1 G5	[not included]	small lakes between sand ridges; near shoreline of lakes, often with *Nuphar variegatum* and various *Potamogeton* spp.
Panicum (Dichanthelium) acuminatum	hot-springs millet	SU G5	in our area around hot springs	tufa mounds and old logs in warm sulphur spring; burned pine ridge between wetlands; young *Pinus banksiana* – lichen community; sandy soils with *Carex siccata*, *Potentilla tridentata*, *Festuca* sp., *Hudsonia tomentosa*, *Arabis lyrata*; opening in young mixed wood forest with *Pinus* sp. and *Betula papyrifera*; sandy knoll; dried up beaver pond; *Pinus banksiana*/*Cypripedium* – *Dichanthelium* stand; graminoid slopes and surrounding *Betula* forest; *Pinus banksiana* forest
Physostegia ledinghamii	false dragonhead	S2 G3?	[not included]	mesic to subhygric mixed forb meadow along the edge of alluvial creek floodplain; wet meadow marsh in riparian zone; transition between wet meadow and drier Precambrian outcrop; pond, slough and ditch margins; river flats; (habitats often subject to intermittent flooding)
Pinguicula villosa	small butterwort	S1 G4	sphagnum bogs	*Picea mariana*/*Sphagnum* bog, on *Sphagnum fuscum* hummocks
Polypodium sibiricum *(misidentified - reported in the past as Polypodium virginianum)*	rock polypody	S2? G5	moist rocky outcrops	mossy areas along exposed rock cliffs; crevices of rocky hillsides; moist crevices in granitic rock outcrop; moss meadow; *Pinus banksiana* – *Betula neoalaskana* forest; *Picea mariana* – *Pinus* spp. area; rocky ledges of island
Potamogeton natans	floating-leaf pondweed	S2 G5	no specific habitat info	lakes; ponds; rivers; oxbow along river; watercourse in *Picea* – *Pinus contorta* forest; (often associated with other *Potamogeton* spp.)
Potamogeton obtusifolius	blunt-leaved pondweed	S2 G5	no specific habitat info	shallow water in *Calla* and *Nuphar* ponds; in water near lakeshore; beneath mat of *Wolffia borealis* in beaver pond
Potamogeton praelongus	white-stem pondweed	S2 G5	in deep water	lakes; ponds; in outflow channel of the lake; (often in deep water)

Element Scientific Name	**Common Name**	**S and GRanks***	**Habitat as described in Moss (1983)**	**Detailed habitat description from ANHIC files****
Potamogeton robbinsii	Robbins' pondweed	S1 G5	no specific habitat info	lakes; slow moving water of sandy-bottomed river; (found in shallow waters)
Potentilla hookeriana	Hooker's cinquefoil	S2 G4	dry rocky slopes	open ground among scattered pines; cliff face near lake; shaded rocky mountain slope; rocky bank and rocky limestone slope; dry *Pseudotsuga* woodland; xerophytic mountain grassland; steep, S-facing slope, stabilized rock slide area; dry, rocky slope; rock crevices on river bank; dry, sparsely vegetated soil around margins of limestone outcroppings in *Pseudotsuga – Pinus* forest; dry grassland on airstrip; in montane community with *Dryas integrifolia*, *Polygonum viviparum* and *Oxytropis cusickii*
Potentilla multifida	branched cinquefoil	S1 G5	gravel bars and open slopes	rock outcrops; till plain dry open meadow; *Pinus banksiana* forest
Salix tyrrellii	Tyrrell's willow	S1 G5T2	[not included]	near crests and on crests of open sand dunes; edge of filled-in wetland in sand dune area
Sagina nodosa	pearlwort	S1 G5	moist gravel	sandy lakeshore
Sarracenia purpurea	pitcher-plant	S2 G5	muskeg	graminoid, shrubby and treed fens (often in rich, but also in poor fens); graminoid marsh; rich patterned fens; on *Sphagnum* near lakeshore; in various *Larix laricina/Picea mariana* stands
Silene antirrhina	sleepy catchfly	SE? G5	dry open areas	steep grassy, S-facing slope, gravelly eroding till; exposed dry slope of Precambrian outcrop; steep bank along lake shore
Sisyrinchium septentrionale	pale blue-eyed grass	S2S3 G3G4	moist grassy areas	sparsely vegetated, eroded depressional site on clay soil; on the edge of depressional wetland; dry sandy soil in open *Pinus flexilis* forest; grassy calcareous flat; dry sandy soil in open *Populus tremuloides – Picea glauca* – (few) *Pinus contorta/Shepherdia canadensis – Juniperus communis* forest; transition area between riparian area and slopes and occasional upland sites; grassy flat by roadside; large sand pit; stony lake shore; *Symphoricarpos occidentalis – Artemisia* sp. shrubland; dry to moist prairie grasslands, sometimes disturbed
Sparganium fluctuans	bur-reed	S1 G5	lakes and streams	No detailed habitat info
Spiranthes lacera	northern slender ladies'-tresses	S1 G5	[not included]	small disturbed zone within moist *Populus tremuloides – Picea* woods
Stellaria arenicola	sand-dune chickweed	S1 G3	shifting sand dunes	slopes and crests of dunes, interdunal wetlands, and infilling ponds in parabolic sand dune system
Tanacetum (huronense) bipinnatum* ssp. *huronense	Indian tansy	S1 G4G5Q	shores, sand dunes, gravel bars	sand dunes; dry areas on sandy lakeshores
Utricularia cornuta	horned bladderwort	S1 G5	bogs, muddy shores	in water near lakeshore; with *Veronica* sp., *Stellaria* sp. and *Drosera* sp. in parabolic sand dune system

Element Scientific Name	Common Name	S and GRanks*	Habitat as described in Moss (1983)	Detailed habitat description from ANHIC files**
Vaccinium uliginosum	bog bilberry	S2 G5	alpine slopes	muskeg in *Populus tremuloides* woods; open *Picea mariana* / *Sphagnum* bog; burned-over bog; boggy *Betula pumila* - feather moss community; rock outcrop; quartzite terrace on mountain top and quartzite lateral moraine; perched bog in permafrost in subarctic woodland; *Picea mariana* / lichen forest; in *Abies bifolia* – *Picea engelmannii* forest; wet *Picea* – *Salix* community; *Dryas octopetala* tundra
Viola pallens	Macloskey's violet	S1 G5T5	moist woods [*V. macloskeyi* ssp. *pallens*]	boggy or sandy lake shores; swamp; wet depression in hay meadow; marshy area along creek; quaking fen; *Betula neoalaskana*/*Salix*/*Carex* -- *Calamagrostis* wetland; ephemeral wetlands with *Carex utriculata*; *Picea mariana*/*Ledum groenlandicum*/*Sphagnum* wetland; *Chamaedaphne calyculata*/*Eriophorum*/*Sphagnum* wetland; dried-up beaver pond

* – GRank and SRank at the time of original data query [for detailed explanation of S and G ranks and for more complete list of codes, please see Appendix 4];

** – Habitat description is generally presented in its original form, and the authors have not attempted to standardize terminology. Reports on rare taxa from highly unlikely habitats that are not supported by a specimen are taken with caution, so this kind of information is not included in this table;

BOLD – indicates species previously found in FGW [(?) after BOLD indicates that the report in Fairbarns (1984) was not supported by a voucher specimen for verification.

APPENDIX 4 – An explanation of sub-national/provincial (S) and global (G) ranks.

[modified from Vujnovic and Gould 2002 - on-line edition of a complete document available at: http://www.cd.gov.ab.ca/preserving/parks/anhic/index.asp]

Elements are evaluated and ranked on their status (globally and state/provincially) using a system developed by NatureServe which is in use throughout North America. Ranking is usually based primarily on the number of occurrences*, since that is frequently the only information available. Information, such as population size and trend, life history and reproductive strategies, range and current threats is used when available. The ranks in Alberta are defined as:

RANK (G=global; S=Alberta)

G1	S1:	≤ 5 occurrences or only a few remaining individuals.
G2	S2:	6-20 occurrences or with many individuals in fewer occurrences.
G3	S3:	21-100 occurrences may be rare and local throughout its range, or in a restricted range (may be abundant in some locations or may be vulnerable to extirpation because of some factor of its biology).
G4	S4:	apparently secure under present conditions, typically >100 occurrences but may be fewer with many large populations; may be rare in parts of its range, especially peripherally.
G5	S5:	demonstrably secure under present conditions, > 100 occurrences, may be rare in parts of its range, especially peripherally.
GU	SU:	status uncertain often because of low search effort or cryptic nature of the element; possibly in peril, unrankable, more information needed.
GH	SH:	historically known, may be relocated in the future.

Other codes include:

R**	reported but lacking sufficient documentation to accept or reject
Q	taxonomic questions or problems
T_	rank for a subspecific taxon
G? or S?	not yet ranked
_?	rank questionable

---

*Occurrence: The definition of what constitutes an occurrence is specified in an Element Occurrence Specifications record and may vary from element to element but generally constitutes an area occupied by the element. Element Occurrence Specifications may specify minimum separation distances between locations of the element before they can be considered as separate occurrences.

**caution should be taken in interpreting SR ranks from jurisdictions other than Alberta; NatureServe 2003 often included not-yet-ranked taxa in this category.

APPENDIX 5 – Rare Native Plant Report Form.

RARE NATIVE PLANT REPORT FORM

Please enter all information available to you and attach a detailed sketch or map showing the location of the population

SCIENTIFIC NAME: ____________________

COMMON NAME: ____________________

OBSERVER NAME, ADDRESS AND TELEPHONE NUMBER: ____________________

OBSERVATION DATE(S): ____________________

PHOTOGRAPH TAKEN: Y / N

SPECIMEN COLLECTED: Y / N **COLLECTION NUMBER**: ____________________

IF YES, NAME HERBARIUM WHERE DEPOSITED: ____________________

LOCATION INFORMATION:

SITE NAME: ____________________

TOPOGRAPHIC MAP NUMBER: ____________________

DIRECTIONS TO POPULATION (*include descriptions of landmarks and distances if possible*):

ELEVATION (*Please do not use elevation from GPS unit*): __________ ft/m (*circle one*)

(*Complete one of the following and accompany with map or sketch*)

UTM EASTING: __________ UTM NORTHING: __________ GRID ZONE: __________

NORTH AMERICAN DATUM: 27 / 83 (*circle one*)

LEGAL: TWP: ______ RGE: ______ W: _____ M SECTION: _____ LSD: __________

LATITUDE: __________ LONGITUDE: __________

Was the location determined using a GPS? Y / N

POPULATION INFORMATION (*include information on extent in cm^2/m^2 (circle one), number of individuals*):

PHENOLOGY (*based on average development phase of population--see over*):

_____ vegetative; _____ reproductive (*E.G. V6, R7 for a species with leaves fully unfolded and in full bloom*)

SITE/HABITAT DESCRIPTION (*include information on habitat [alpine, aquatic, cliff, forest, grassland, peatland], plant communities / dominant species / associated species / other rare species / substrate / soils / phenology of dominant species*):

ASPECT: ______ SLOPE: __________ MOISTURE: __________

OWNERSHIP (*if known. Include name/address/phone number*): ____________________

CURRENT LAND USE: ____________________

HABITAT THREATS/MANAGEMENT CONCERNS: ____________________

Return to: *Alberta Natural Heritage Information Centre, 2^{nd} Floor, 9820 106 Street, Edmonton, AB T5K 2J6 (780) 427-5209 Thank You.*

Phenology Codes (after Dierschke, 1972)

VEGETATIVE

Deciduous Tree or Shrub

0 Closed Bud
1 Buds with green tips
2 Green leaf out but not unfolded
3 Leaf unfolding up to 25%
4 Leaf unfolding up to 50%
5 Leaf unfolding up to 75%
6 Full leaf unfolding
7 First leaves turned yellow
8 Leaf yellowing up to 50%
9 Leaf yellowing over 50%
10 Bare

Conifer

0 Closed Bud
1 Swollen bud
2 Split bud
3 Shoot capped
4 Shoot elongate
5 Shoot full length, lighter green
6 Shoot mature, equally green

REPRODUCTIVE

0 Without blossom buds
1 Blossom buds recognizable
2 Blossom buds strongly swollen
3 Shortly before flowering
4 Beginning flowering
5 In bloom up to 25%
6 In bloom up to 50%
7 Full bloom
8 Fading
9 Completely faded
10 Bearing green fruit
11 Bearing ripe fruit
12 Bearing overripe fruit
13 Fruit or seed dispersal

Herbs

0 Without shoots above ground
1 Shoots without unfolded leaves
2 First leaf unfolds
3 2 or 3 leaves unfolded
4 Several leaves unfolded
5 Almost all leaves unfolded
6 Plant fully developed
7 Stem and/or first leaves fading
8 Yellowing up to 50%
9 Yellowing over 50%
10 Dead

0 Without blossom buds
1 Blossom buds recognizable
2 Blossom buds strongly swollen
3 Shortly before flowering
4 Beginning bloom
5 Up to 25% in blossom
6 Up to 50% in blossom
7 Full bloom
8 Fading
9 Completely faded
10 Bearing green fruit
11 Bearing ripe fruit
12 Bearing overripe fruit
13 Fruit or seed dispersal

Grasses

0 Without shoots above ground
1 Shoots without unfolded leaves
2 First leaf unfolded
3 2 or 3 leaves unfolded
4 Beginning development of blades of grass
5 Blades partly formed
6 Plant fully developed
7 Blades and/or first leaves turning yellow
8 Yellowing up to 50%
9 Yellowing over 50%
10 Dead

0 Without recognizable inflorescence
1 Inflorescence recognizable, closed
2 Inflorescence partly visible
3 Inflorescence fully visible, not unfolded
4 Inflorescence unfolded
5 First blooms pollenizing
6 Up to 50% pollenized
7 Full bloom
8 Fading
9 Fully faded
10 Bearing fruit
11 Fruit or seed dispersal

Ferns

0 Without shoots above ground
1 Rolled fronds above ground
2 First frond unfolds
3 2 or 3 fronds unfold
4 Several fronds unfolded
5 Almost all fronds unfolded
6 Plant fully developed
7 First fronds fading
8 Yellowing up to 50%
9 Yellowing over 50%
10 Dead

0 sori absent
1 sori green, forming
2 sori mature, darker, drier
3 sori depressing, strobili forming in lycopodium